NETWORK WORLD

The Newsweekly of User Networking Strategies

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Novell, Lotus call it quits at the altar

By Laura DiDio
Senior Editor

CAMBRIDGE, Mass. — Lotus Development Corp. last week said it will revert to its original network application development plans rather than actively seek another partner following the sudden demise of its proposed merger with Novell, Inc., according to President, Chairman and Chief Executive Officer Jim Manzi.

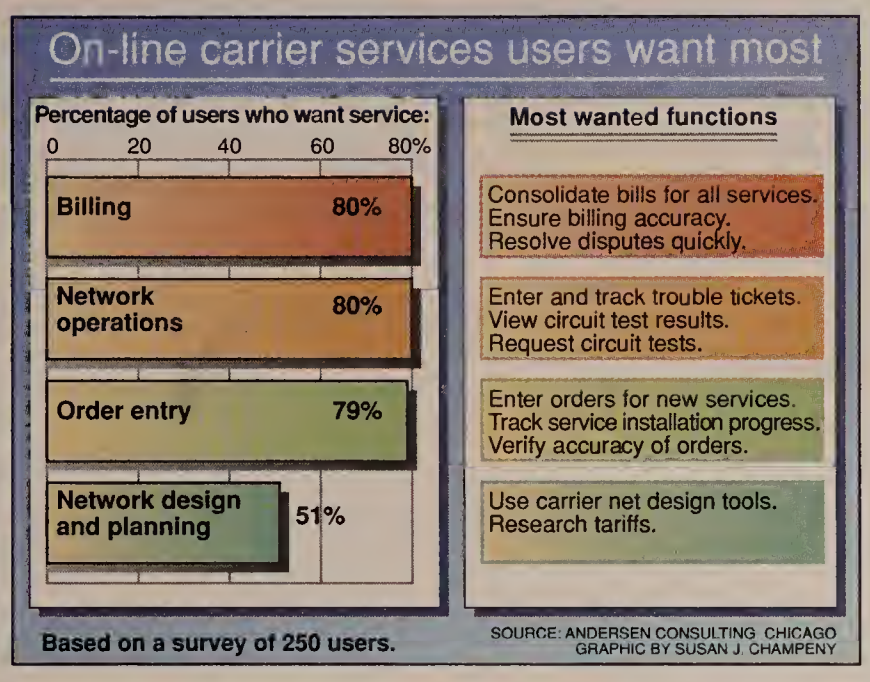
The $1.5 billion merger collapsed nine days ago when Novell, in a last minute reversal, demanded equal representation on the merged company's board of directors.

Manzi said he left town May 17 for a family vacation at Disney World satisfied that the deal was set to go through. "When our lawyer called me with the news the next night [that Novell was demanding equal representation on the board] I thought it was a joke," he said.

Lotus had said from the beginning that a board with four members from each company was out of the question. The company had made many other last-ditch concessions to appease Novell and its shareholders, Manzi said.

Lotus had agreed to make Novell President, Chairman and CEO Raymond Noorda chairman

(continued on page 73)



Users push telcos to offer on-line net management

Customers seek access to carrier control systems.

By Bob Brown
and Jim Brown
Network World Staff

Local and long-distance carriers are under pressure to open up their internal net management systems to give customers better control over network services.

On-site access to carriers' systems enables users to report service problems, order new services, track problem resolution, manipulate billing data, and use the carriers' net design tools and tariff data bases, among other things.

Some carriers — such as AT&T and MCI Communications Corp. — already offer services that support some of those capabilities, allowing users to manage specific offerings such as 800 service. But users are increasingly demanding tools that will enable them to manage all services from one workstation.

"Having access to carrier data bases is important," said Lee Figliuolo, vice-president of information services operations at Progressive Casualty Insurance Co. in Cleveland. "It will allow us to get what we need to get done much more quickly. Some day, I'd like a service that would allow us to reach data bases of several carriers from a single terminal."

User interest in such services is illustrated by a recent Ander-

(continued on page 74)

AT&T unveils virtual data network service

Heralded Software-Defined Data Network bows at ICA show; high-speed data links on demand.

By Bob Wallace
Senior Editor

NEW ORLEANS — AT&T last week introduced its long-awaited Software-Defined Data Network (SDDN) service, the data equivalent of its virtual voice service, at the International Communications Association's annual conference here.

SDDN will be offered as an option to AT&T's Software-Defined Network service and will enable users to establish high-speed switched data links on demand for applications such as disaster recovery, local-area network interconnection and videoconferencing.

The service, accessed using Integrated Services Digital Network Primary Rate Interface (PRI) or AT&T's Dataphone Digital Service facilities, will support 56K, 64K and 384K bit/sec links. SDDN complements the Accunet Switched 384 data service AT&T announced two weeks ago for non-SDN customers ("AT&T to add switched 384 data service," *NW,* May 21).

AT&T said NCR Corp. will be the first company to test SDDN in a field trial scheduled to begin in July (see "NCR first to beta-test AT&T's SDDN," page 77).

SDDN is targeted at the roughly 500 current SDN customers and will be more economical than private lines for users with less than four hours of data traffic a day, AT&T said.

As an option of SDN, the ser-

(continued on page 77)

PHOTOS ©1990 BEVIL KNAPP/BLACK STAR

FCC Chairman Alfred Sikes

Sikes speaks out on price cap dispute

By Anita Taff
Washington Bureau Chief

NEW ORLEANS — FCC Chairman Alfred Sikes said last week the Federal Communications Commission intends to move ahead with price cap regulation for local exchange carriers despite strong protest by users and other parties.

Sikes discussed price caps and other issues in an interview following his speech at the International Communications Association's annual conference here. In that address, he assured users that the FCC will heed their concerns in setting telecommunications policy.

Users, long-haul carriers and state regulators have criticized the FCC's current price cap plan. But Sikes told *Network World* there is no question that price caps should be implemented for local carriers "because rate-of-return regulation is bankrupt."

(continued on page 78)

NETLINE

NEWSPAPER

FEATURE

Savvy managers sensitive to needs of end users

By Chris Hartman
Special to Network World

A network manager's job involves more than just making sure the network and the workstations it connects function properly. All computer systems are dependent on each user's ability to properly operate them. The attitudes users develop toward the network are often influenced by the attitude of the net manager.

Effective network managers realize that the value of users' efforts far surpasses capital investment in hardware and software. The amount of man-hours invested in the products of a network is staggering. Thousands of files, documents, records and programs developed or inputted by company personnel reside in the file server. The dollar value of this work to the company is almost inestimable.

Most network managers adopt a conservative attitude toward network additions and

(continued on page 59)

U.S. users get on-demand satellite links to France

Bandwidth On Demand service lets users request 56K to 1.92K bit/sec links just before they need it.

By Barton Crockett
Senior Editor

NEW ORLEANS — France Telecom and TRT/FTC Communications, Inc. last week unveiled a service that lets users establish on-demand satellite links from the U.S. to France that range in speed from 56K to 1.92M bit/sec.

The introduction took place at the International Communications Association's annual conference here, along with several other France Telecom announcements, including price reductions totaling as much as 15% on private lines to the U.S. and a new transatlantic 9.6K bit/sec digital service.

The satellite-based Bandwidth On Demand service will enable users to obtain international satellite capacity a few minutes before they need it by using a terminal or personal computer on their premises to dial into the carrier's net operation center. In most cases, users will require dedicated access to carrier facilities.

Satellite capacity will be supplied by the International Telecommunications Satellite Organization. In addition to a monthly subscription charge, Sharyn Yensko, product marketing manager with TRT/FTC Communications, said users will be billed for satel-

(continued on page 8)

ICA urges users to pressure RBHCs to address needs

Paper advises users to seek regulators' help.

By Anita Taff
Washington Bureau Chief

NEW ORLEANS — The telecommunications needs of business users are going unmet because local carriers are more interested in perpetuating their monopoly hold on the local loop than in responding to customer demands, the International Communications Association (ICA) said last week.

In a 20-page white paper released at the ICA's annual conference here, ICA said it is imperative that users pressure state regulators and local exchange carriers to become more responsive to the needs of business users.

"[ICA] is very concerned about the growing discord between the LECs' business-as-usual attitude and the needs of sophisticated business users," said Michael Crampton, director of telecommunications public policy and industry analysis at The Travelers Corp.

In the white paper, prepared by ICA's Public Policy Committee, three major concerns about the RBHCs were identified.

The group said local carriers are restricting users' access to new network capabilities by bundling services that should be sold separately and pricing new capabilities well above cost. "[By]

(continued on page 75)

Modem users examine the options of new DSU/CSUs

By Paul Desmond
Senior Writer

NEW ORLEANS — A number of vendors at the International Communications Association's annual conference here last week introduced enhanced data service unit/channel service units (DSU/CSU), underscoring a growing interest in the devices as users look to migrate to digital networks.

Many of the criteria for buying DSU/CSUs are the same as for modems, including the network management scheme supported, multiplexing capabilities, automatic dial restoral and cost, users said.

"We don't want to give up the control we've had with modems," said James Laux, information services officer for Firstar Information Services Corp., a Milwaukee company that provides information services for banks. Firstar is currently studying digital services to determine when the time will be right to start swapping out its 500 modems for DSU/CSUs.

Laux said any DSU/CSU his company buys will have to support at least basic features such as line diagnostics, central site trouble reporting and fault isolation, along with more advanced features such as integral time-division multiplexing (TDM) and automatic dial restoral.

(continued on page 77)

Briefs

AT&T fiber cut kills T-3s. Two weeks after fiber cuts paralyzed segments of its competitors' networks, AT&T had a cut of its own that knocked out 163 T-3 lines for over five hours. A construction crew severed an AT&T fiber route in Villa Rica, Ga., cutting off service between Atlanta and Birmingham, Ala., and limiting calls into and out of the two cities on May 18. A large but unspecified number of business and residential customers were affected by the outage. Service was fully restored at 7:30 p.m. Eastern Standard Time.

AT&T to speed ISDN deployment. AT&T has once again accelerated its deployment schedule for Integrated Services Digital Network. The carrier now says it will support the service in 322 domestic locations, plus links to France, Japan and the U.K. by June 1, 1990. Furthermore, AT&T said ISDN will be available in 343 U.S. locations by year end.

COS, MAP/TOP join forces. The Corporation for Open Systems International (COS) at its third international meeting in Brussels, Belgium, voted to accept the Information Technology Requirements Council and its MAP/TOP Users Group as members of COS. The move paves the way for the roughly 500 members of the Manufacturing Automation Protocol/Technical and Office Protocol group to join COS as a Requirements Interest Group, thus retaining identity as a separate users group within COS. During the meeting, the COS board elected a new chairman, Ray Pardo, chief telecommunications engineer for Bechtel Group, Inc. Pardo succeeds Robert Metcalfe, former vice-president of 3Com Corp. Separately, COS also announced that Bull HN Information Systems, Inc. is the first vendor to be certified as a COS First Party Test Center, allowing the company to test Open Systems Interconnection products for conformance with the standard.

Portable computer users unite. An overwhelming number of business travelers would like hotels to do away with hard-wired telephones and inaccessible telephone jacks, according to a recent survey by the Electronic Mail Association (EMA). "[The survey] sends an unmistakable message to the lodging industry that major U.S. corporations are rapidly adopting portable computer technology for electronic mail and other information needs," said Michael Cavanagh, executive director of EMA.

Almost 85% of those surveyed said knowledge of a hotel's in-room computer communications capabilities would be a significant factor in selecting a hotel. Ninety-three percent said hotels should advertise whether their facilities can accommodate the communications needs of portable computer users. The survey, which was sent out to EMA members, was based on responses from 64 companies, 24 of which have more than 10,000 employees.

CONTENTS

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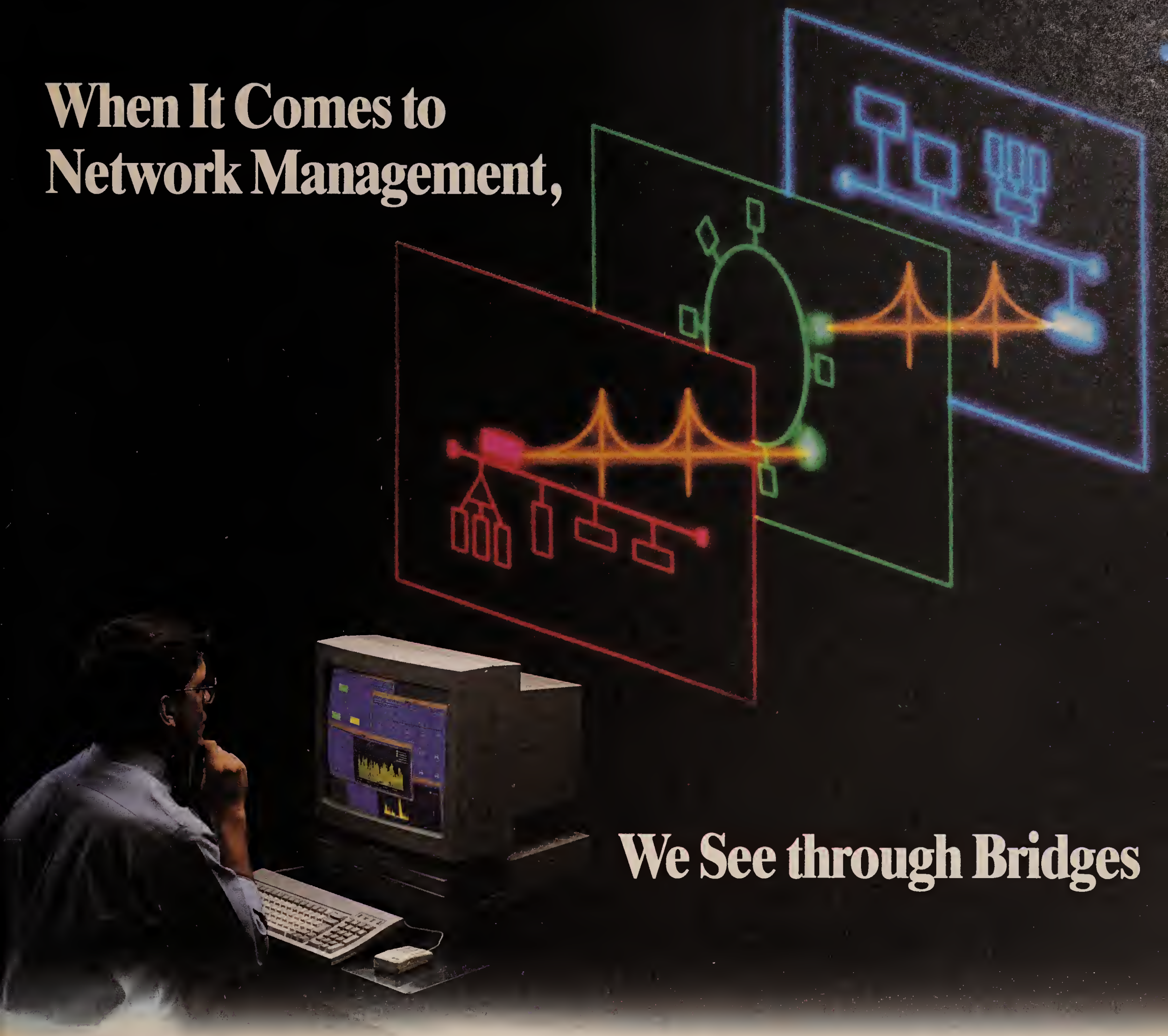

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See The FAXNet Form on Page #72

3Com cofounder Metcalfe resigns as vice-president

Ethernet inventor passed by as firm's president.

By Laura DiDio
Senior Editor

SANTA CLARA, Calif. — Ending months of speculation, 3Com Corp. Vice-President Robert Metcalfe last week made his retirement official, saying he would leave the company he cofounded 12 years ago.

Reports that Metcalfe would leave 3Com or continue in a reduced capacity have been making the rounds since last December, when the company's board of directors appointed a triumvirate of executive vice-presidents — Eric Benhamou, Leslie Denend and Robert Finocchio — to run the company and made it clear that one of the three would succeed William Krause as president.

Earlier this month, Benhamou was named president and given the charter to implement a "renaissance plan" designed to keep the company at the leading edge of networking in the 1990s.

When Metcalfe was passed by as heir to Krause's presidential post — a position he once held and has long since hoped to regain — he decided to resign.

"I wanted to be president of the company, but the board decided otherwise and I respect their decision," Metcalfe said in an interview with *Network World* following the announcement that he would retire next week.

Metcalfe said that after playing a pivotal role as one of the original founders of 3Com and being the driving force behind its Ethernet technology (which he coinvented while at Xerox Corp. in the 1970s), the idea of having a diminished role such as a company spokesman or conducting traveling seminars did not appeal to him.

"There's an old adage that goes: 'Lead, follow or get out of the way.' I've led 3Com as its first chairman and president. I've been a follower as vice-president of engineering and vice-president of sales and marketing, and

(continued on page 71)

Show highlights growing popularity of X Window

By Susan Breidenbach
West Coast Bureau Chief

SAN JOSE, Calif. — The esoteric X Window System has moved closer to the computing mainstream during the past year, if events at Xhibition 90 here last week are any indication.

The potential user base for X Window System technology was broadened considerably at this year's show: Quarterdeck Office Systems, Inc. announced it was incorporating X Window into its popular Desqview DOS memory manager, and several companies introduced tools that will turn old character-based applications running on legacy systems into X Window applications.

Attendance at the show more than doubled from last year to 5,500. The number of exhibiting vendors also increased from Xhibition 89 from 55 to 75. There was even a good sprinkling of users among the independent software vendors that traditionally have comprised the audience at the 2-year-old event.

"People knew what X was this year," said Noel Poore, a product manager at IXI, Ltd., a 3-year-old software company in Cambridge, England, that specializes in X Window technology. "Last year, we were spending a good deal of our time explaining it."

Originally developed at the Massachusetts Institute of Technology in Cambridge, Mass., X Window defines a standard that applications can use to display bit-mapped graphics on computer screens. Using the client/server model, X Window divides the application (client) and its graphical user interface (display server) into two distinct parts that can be processed either in the same machine or in different computers connected by a local-area network.

The idea is to enable developers to write applications without regard to the type of display device that will ultimately deliver them to users. And users will be able to use a single X Window display to view applications running on a variety of hosts scattered across a heterogeneous network.

While X Window has been closely associated with Unix, it is actually a vehicle for cross-system integration, as demonstrated by Quarterdeck's new Desqview/X. Scheduled for release later this year, the product implements X Window on DOS so that X Window and DOS applications can be displayed simultaneously in windows on a single personal computer. The company has not announced pricing.

The applications that are displayed can be running either in the same personal computer or in some other machine across a Novell, Inc. NetWare or Transmission Control Protocol/Internet Protocol LAN. Similarly, users on X Window-based workstations, minicomputers or mainframes will be able to run DOS applications on remote Desqview/X sys-

(continued on page 8)

Hughes Network supports frame relay on IPN switch

By Paul Desmond
Senior Writer

NEW ORLEANS — Hughes Network Systems, Inc. last week became the latest vendor to throw its weight behind the emerging frame-relay standard by pledging to support the technology on its Integrated Packet Network (IPN) packet switches.

Frame relay is an Integrated Services Digital Network standard that defines an interface between two data communications devices and provides for high-speed transfer of data between them. It also defines an addressing technique that helps speed the flow of data across a backbone.

Backbone support

Hughes said it plans to support the interface standard through backbones based on its IPN switches, similar to the frame-relay strategy Netrix Corp. announced at the International Communications Association's 43rd Annual Conference and Exposition here ("Netrix to support frame relay across backbone nets," *NW,* May 21).

This promises to let an IPN backbone retain the benefits of frame relay, such as speed and routing improvements, which could be lost if the company uses a proprietary protocol between switches.

Hughes is working with a number of other vendors to make sure their various implementations of the frame-relay standard will work together, said Larry Mauceri, senior director of product marketing for the company.

Among those vendors are Codex Corp., Proteon, Inc. and Wellfleet Communications, Inc., each of which has yet to announce its own frame-relay plans.

Hughes is also teaming with a number of vendors that have already announced support for frame relay, including cisco Systems, Inc., Digital Equipment Corp., StrataCom, Inc. and Vita-

(continued on page 73)

N.J. PUC issues ultimatum to MCI for LATA access fee

By Ellen Messmer
Washington Correspondent

NEWARK, N.J. — The New Jersey Board of Public Utilities has ordered MCI Communications Corp. to comply with regulations governing intra-LATA traffic or be restricted from offering services in the state.

Under the board's regulations, interexchange carriers are banned from originating and terminating traffic within a local access and transport area unless they pay an 8.22 cents-per-minute compensation charge to New Jersey Bell Telephone Co.

Despite requests from the board during the past year, MCI has refused to file a list of services it provides on an intra-LATA basis and has evaded paying the compensation charges for intra-LATA calls it completed for customers.

The public utilities board instituted the compensation charge, which must be paid above and beyond the normal access charges, as a way to protect the residential rate base of New Jersey Bell, which subsidizes residential rates with revenues from business. If intra-LATA competition were allowed, business customers might abandon New Jersey Bell in favor of other providers.

The board wants interexchange carriers to refrain from competing with New Jersey Bell but is willing to let them complete any intra-LATA call as long as they compensate New Jersey Bell for presumed lost traffic. The 8.22 cents represents an average toll call rate.

Pay up or get out

MCI filed a petition on May 1 with the public utilities board, asking it to authorize intra-LATA competition or at least eliminate the compensation charge. The board rejected the request and told MCI to start making payments to New Jersey Bell immediately or face a court order. "If MCI cannot comply with the order of this board, they don't have to do business in this state," said Scott Weiner, president of the public utilities board.

The board has offered to conduct a legal proceeding to reconsider the rate of compensation. AT&T and US Sprint Communications Co. have said they will join MCI at that proceeding to protest the compensation charge.

Since 1986, AT&T has reluctantly paid compensation to New Jersey Bell in order to provide intra-LATA Software-Defined Network, 800 Readyline, Megacom, Megacom 800 and MultiQuest services to business customers. US Sprint began payments to New Jersey Bell in January 1990 to provide its FONline 800, Ultra 800, Direct 800, Advanced

(continued on page 75)

Group appeals order telling Greene to reconsider MFJ

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — A coalition of vendor and users groups has served notice that it intends to appeal to the U.S. Supreme Court to stop a lower court from forcing U.S. District Court Judge Harold Greene to reconsider a ruling blocking the regional Bell holding companies from providing information services.

The group recently asked the U.S. Court of Appeals for the District of Columbia to suspend implementation of its order until the Supreme Court decides whether to hear the group's appeal. In April, the appeals court ruled that Greene used the wrong legal standards in evaluating whether to lift business restrictions imposed on the RBHCs by the Modified Final Judgment. It is expected that the appeals court will rule within the week on the request for a stay.

The appeals court ordered Greene to reconsider his decision preventing the RBHCs from offering information services.

Members of the coalition include Adapso, the Alarm Industry Communications Committee, the Computer Software and Services Industry Association, Inc., the Consumer Federation of America, the Independent Data Communications Manufacturers Association, Inc., Maryland's People's Counsel, MCI Communications Corp., Phone Programs, Inc. and Tandy Corp. MCI said other par-

(continued on page 75)

Clarification: The front-page graphic of the May 14 issue showing the declining growth of the T-1 multiplexer market was for the U.S. end-user market only.

Correction: Due to an editing error, the story titled "How local loops carry T-1" (*NW,* May 14) gave the encoded signaling rate of the 160K bit/sec Basic Rate Interface as 80K bit/sec when it should have been 80K baud.

Sometimes you just need
a flexible board.

IRMAtrac Token-Ring. Coming soon from DCA.

GM to build VSAT network linking headquarters, 9,700 dealerships

Network will help the carmaker escape rising dial-up costs.

By Tom Smith
New Products Editor

DETROIT — General Motors Corp. last week said it will build a very small aperture terminal net supporting data and video communications between company headquarters here and its 9,700 dealerships.

The GM Pulsat Ku-band network, billed by GM as the world's largest satellite net, will multiply network capacity available to dealers currently using dial-up lines. Moreover, once the VSAT net has been implemented and dial-up lines have been scrapped, GM will be insulated from escalating dial-up costs.

Pulsat will allow all of GM's dealers to receive video programs that are currently accessed only by 2,000 sites. Those 2,000 sites are supported by two smaller VSAT nets that only support video.

With the announcement of Pulsat, GM joins the ranks of several competitors that have implemented VSATs to provide better service and faster access to information ("VSATs help automakers face future," *NW,* Dec. 4, 1989).

Pulsat will support a variety of data applications, consisting primarily of X.25 traffic but also supporting some IBM Systems Network Architecture data, according to Donald Read, telecommunications mananger for dealer systems at Electronic Data Systems Corp. (EDS), the GM subsidiary that will implement and operate the network. Pulsat will be based on hardware from Hughes Network Systems, another GM subsidiary. GM will foot the bill for the network but declined to cite a cost for the net.

Those applications, supported from a private hub at an EDS site in Auburn Hills, Mich., will allow dealers to transmit and receive a variety of messages and requests from on-site VSATs, including credit and financing inquiries, computer-aided auto maintenance, as well as on-line parts and service information.

VSATs will allow dealers to conduct real-time inquiries about vehicle availability and options, according to Dunc Brodie, general director of dealer systems and communication for GM.

"Whereas today, because of [backups associated with] batch transmissions and delays through terrestrial systems, we cannot give that kind of response," Brodie said. Such an inquiry often cannot be completed the same day, he added.

Slow response time, as well as cost, have become increasingly significant issues as GM saturates dial-up lines with data traffic, which is expected to increase 20% annually over the next five years.

VSATs will also provide the bandwidth necessary to accommodate this existing traffic as well as evolving high-bandwidth applications such as on-line access to repair manuals.

Pulsat will be used to extend the existing GM Dealer Satellite Network, which broadcasts video news and training programs to more than 2,000 dealers.

See The FAXNet Form on Page #72

Microsoft intros Version 3.0 of Windows system

By Laura DiDio
Senior Editor

BOSTON — Microsoft Corp. last week unveiled the long-awaited Version 3.0 of its Windows graphical user interface software featuring extensive networking capabilities.

Windows 3.0, which cost Microsoft an estimated $100 million and took almost seven years to develop, will likely prolong the life of MS-DOS-based personal computer networks and could further delay acceptance of OS/2 and the OS/2 LAN Manager network operating system.

Windows 3.0 offers users an extensive and user-friendly icon-based shell that shields them from the complexity of MS-DOS commands and makes it easy to manage and manipulate files regardless of whether they reside on a personal computer or local-area network file server.

Windows 3.0 runs on both MS-DOS and PC-DOS workstations and lets users access servers in any network that supports Network Basic I/O System.

The enhancements also, for the first time, make LAN resources readily available to the Windows environment, according to Microsoft Chairman William Gates.

Beginning with its Setup program, Windows 3.0 recognizes the network and helps users view and access network resources from their desktops. All network interaction and access is performed by the user within the Windows environment. This is accomplished via a set of network drivers that are bundled into the software.

The user shell, which runs on personal computers, consists of three components. The first, called Program Manager, is an icon-based application starter. Each application is depicted by a unique icon and name that the user can customize to suit

(continued on page 77)

Sometimes you just need
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IRMAtrac Token-Ring. Coming soon from DCA.

Top Call for Innovation winners honored for work

Net execs highlight usage of communications technology in solving their business problems.

By Wayne Eckerson
Senior Writer

NEW ORLEANS — The International Communications Association (ICA) last week honored three network executives for their innovative use of communications technology in solving business problems.

> The library allows applications to spread processing among computers.
>
> ▲▲▲

The network executives were selected as finalists in the fourth annual Call for Innovation program, which is cosponsored by ICA and *Network World*. The three finalists presented papers outlining their ground-breaking network projects during a featured session at the annual ICA conference.

"The Call for Innovation program recognizes innovative users that employ network products and services to gain a competitive advantage by cutting costs, improving operations or gaining market share," said *Network World* Editor John Gallant during the opening remarks at the session.

John Crankshaw

Winner's circle

The winners were: John Crankshaw, manager of telecommunications at Steelcase, Inc. in Grand Rapids, Mich.; Raymond Neff, vice-president of information systems at Case Western Reserve University in Cleveland; and Edmund Zaharewicz, systems architect, and Steven Levy, vice-president of quantitative analysis, at The Putnam Companies in Boston.

Crankshaw described how Steelcase devised an integrated messaging strategy to reduce the company's unanswered call rate, which skyrocketed to 22% in 1986 after a period of strong business growth ("Call handling plan given carte blanche," *NW,* May 21).

Steelcase combined a central

Raymond Neff

message center staffed by telephone operators and a variety of messaging technologies, including electronic mail and voice mail, to handle an average of 3,500 calls a day at the company's corporate headquarters in Grand Rapids.

Since 1988, when the integrated messaging system went into use, Steelcase has reduced its unanswered call rate to 7%. The company said it plans to reduce its unanswered call rate to 3% by 1991 and migrate the system to all its domestic sites.

Neff described Case Western Reserve's project to build a fully fiber-optic campus network that will support data, voice and video communications. The 7,000-node network will interconnect multivendor equipment in 85 campus buildings, including faculty offices, student dormitory rooms, libraries and laboratories. All buildings are wired with fiber going directly to wall outlets.

According to Neff, the network, which supports Ethernet and Transmission Control Protocol/Internet Protocol, will serve as a model for future network development for businesses and universities. It will also give the university an advantage in attracting new students.

By year end, the school's backbone fiber network will support Synchronous Optical Network standards and will operate at up to 622M bit/sec, Neff said. The fiber network will also be linked into a metropolitan-area network using the proposed IEEE 802.6 metropolitan network standard, he added.

Zaharewicz of The Putnam Companies, a pension management firm, described a library of software development tools known as the Financial Workbench, which assists programmers in constructing distributed applications ("Distributed application tool pays off for Putnam," *NW,* Feb. 5).

NCS based

Based in part on the Network Computing System, a distributed computing technology developed by Hewlett-Packard Co.'s Apollo Division, the library allows programmers to write financial applications that spread processing chores among multiple computers on a network.

While the Financial Workbench is geared to development of financial applications, the concepts underlying the system can be adopted by any organization, Zaharewicz said.

The library provides a common set of objects written in the C++ language and uses the Interviews graphical user interface, which is based on X Window.

Copies of the finalists' papers as well as 11 other papers submitted to the Call for Innovation program can be obtained by calling ICA at (800) 422-4636.

Network managers of ICA member companies who wish to participate in next year's Call for Innovation program can obtain an entry form by calling ICA or *Network World* at (800) 622-1108.

Edmund Zaharewicz

U.S. gets satellite links to France

continued from page 2

lite usage in 10-minute increments.

While prices have not been finalized, France Telecom's international services manager, Jean-Paul Cossart, said customers who use the service less than two to three hours a day will find it more economical than using a private line.

France Telecom officials said the carrier has proposed charging users as little as $175 per hour for a 56K bit/sec link and $2,218 per hour for a 1.92M bit/sec link.

Until the service is tariffed in the U.S., which should only take a few weeks, Yensko said customers can use Bandwidth On Demand for free as part of a pilot test. "We'd like to get our name associated with an avant-garde service like this," she said.

Cossart said INTELSAT is marketing the service to carriers around the world and that any carrier could offer it, but TRT/FTC Communications is the only U.S. carrier that has expressed interest in it. Canada's monopoly international carrier, Teleglobe Canada, said it also plans to offer the service.

TRT/FTC Communications plans to offer the service in conjunction with Belgium's national carrier, Regie des Telegraphes et Telephones, by year end.

Cossart said a similar, pan-European bandwidth on demand satellite service has been offered by European carriers for more than a year. Between 100 and 150 European user companies and organizations subscribe to the service.

France Telecom also announced last week that it will cut the cost of its half of transatlantic T-1 and European T-1 circuits by 7% and the cost of its half of transatlantic 64K bit/sec circuits by 15% starting July 1. Each of the two carriers involved in providing an international circuit bills users separately.

Daniel Elalouf, France Telecom's product manager for international private networks, said the price cuts were needed to compete with price reductions from U.K. carriers, as well as the rising value of the franc against the U.S. dollar. He said the cuts represent the latest salvo in the increasing price war among European carriers to become the most popular net hub for U.S. companies operating abroad.

Elalouf said the price reductions make France Telecom's rates for transatlantic private

> "We'd like to get our name associated with an avant-garde service like this."
>
> ▲▲▲

lines lower than every European carrier except London-based Mercury Communications, Ltd.

Additionally, France Telecom said it will introduce a new satellite-based, transatlantic 9.6K bit/sec digital private-line service priced at $2,600 per month for the French half of the circuit, compared with $4,284 per month for its existing 64K bit/sec service, which was formerly the slowest transatlantic digital service provided by the carrier.

France Telecom will also reduce the price of its half of all digital private lines to the U.K. by 12%. Similar reductions are planned for analog private lines to the U.K. that are tariffed for data services.

Finally, the carrier said it plans to begin offering private-line services over the Private Trans-Atlantic Telecommunications undersea fiber-optic cable as a backup for private lines on the Trans-Atlantic Telecommunications-8 undersea fiber-optic cable. France Telecom is part owner of that cable.

Growing popularity of X Window

continued from page 4

tems while displaying them in an X Window locally.

Besides providing such cross-system integration, Desqview/X, like other X Window implementations, can also be used to distribute tasks to idle machines around the network.

Quarterdeck will be offering Desqview/X with optional tool kits supporting the Open Software Foundation's OSF/Motif and Sun Microsystems, Inc.'s Open Look, the two leading window managers for X Window.

While Desqview/X should help move X Window into the DOS environment, other products announced at Xhibition 90 are taking aim at the huge installed base of systems running character-based applications.

X Window has a facility called xterm for running such applications in an X Window, but they behave within that window just as they would if they were running on an ASCII terminal, forcing the user to interact with the X Window and non-X Window applications in two different ways.

AT&T introduced a software tool called A Language Extension to X (ALEX) that can be used to move a character-based application under a consistent X Window Open Look graphical user interface without having to make any changes to the application's underlying source or binary code.

Pricing for ALEX starts at $2,950 for a developer's kit and ranges up to $10,000 for an unlimited run time license.

IXI's new X.deskterm hides X Window from the user entirely. The product takes the character output from the application and converts it to a graphical display. The application is not changed at all so it can still be used from non-graphical terminals.

X.deskterm can be used to add a graphical interface to applications written in languages such as COBOL that do not have an X Window library or to applications that run on operating systems such as VM or MVS that do not currently support X Window directly. The product has been released, but U.S. pricing was not available at press time.

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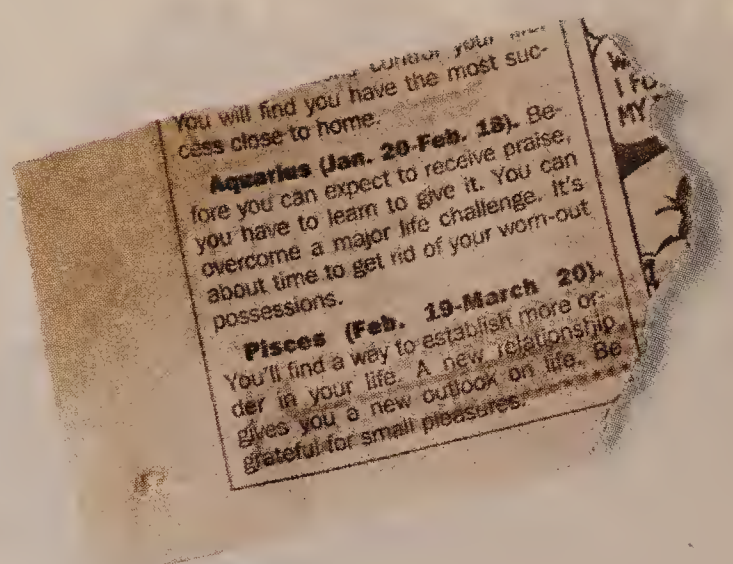
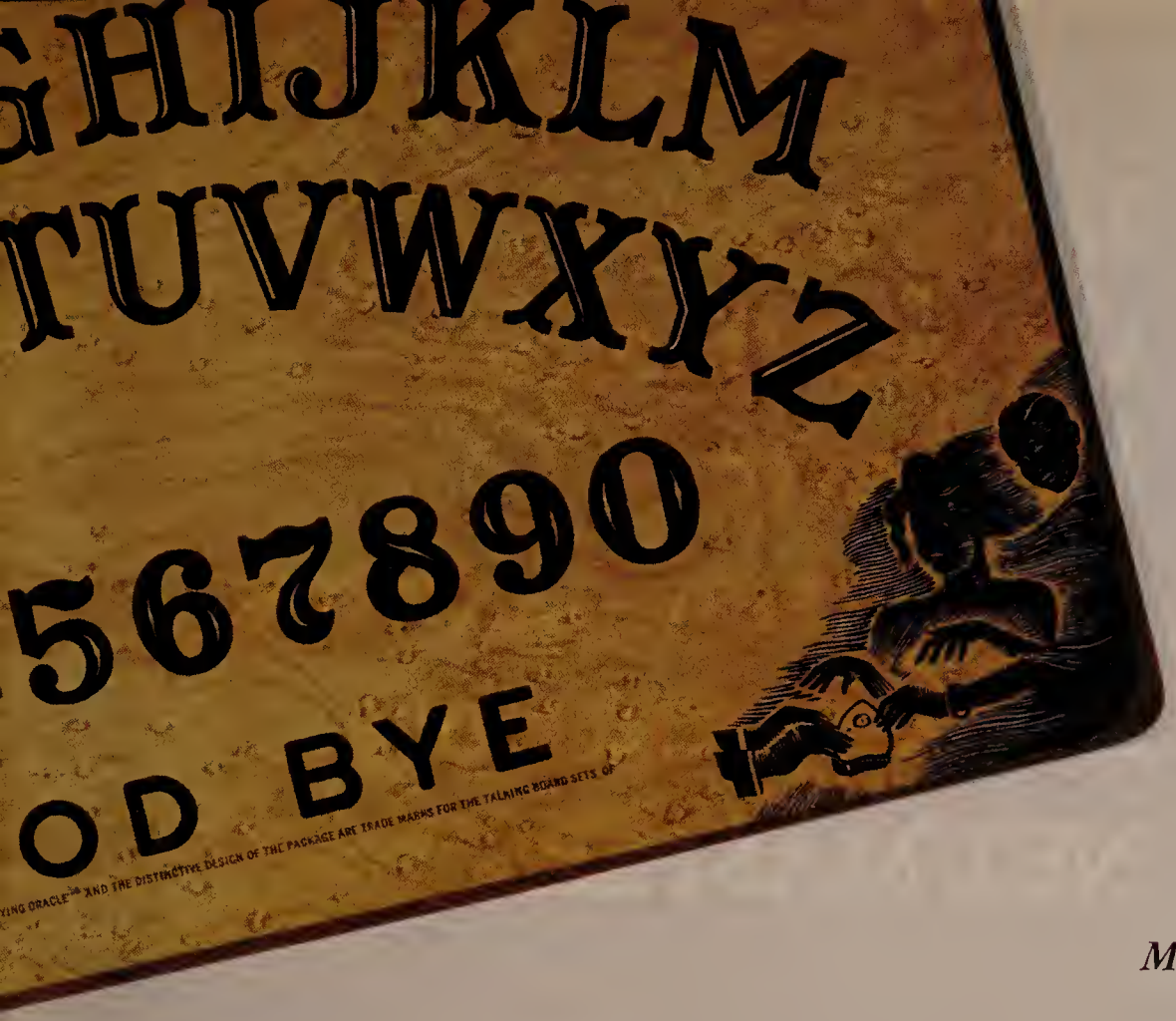


Predicting compatibility for
Delivering it today is another.



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Worth Noting

"No one ever expected to see the alternate long-distance carriers gain as much market share as they did at AT&T's expense. The RBHCs don't want to take any chances with the [alternate access carriers.]"

Barry Gilbert
Principal
TFS, Inc.
Westford, Mass.

People & Positions

World Communications, Inc. (WorldCom) last week announced that it has hired **Marian Wieghorst** as director of sales for switched services.

Wieghorst, who had previously worked for US Sprint Communications Co. as a New York region marketing manager, will be responsible for supporting WorldCom's new line of international switched services.

International Data Corp. (IDC) last week named **Gigi Wang** to the position of vice-president of communications research and consulting.

Wang, who most recently served as director of communications research and consulting at Boston-based The Yankee Group, will direct IDC's communications research and consulting activities worldwide.

Wang will report to **Kim Myhre,** a senior vice-president at IDC.

CSC Partners, Inc. last week said it has promoted **James Saviano** to chairman and chief executive officer of the systems integration, consulting and services firm.

Saviano, formerly a vice-chairman of the company, takes over for **Paul Crowley,** who was recently named president of the commercial group of parent company Computer Sciences Corp.

Senate committee passes RBHC manufacturing bill

Hollings bill faces opposition on Senate floor.

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — For the first time since divestiture, a congressional committee last week approved a bill that would allow regional Bell holding companies to design and manufacture equipment.

By a voice vote, the Senate Commerce Committee gave its nod to the Telecommunications Equipment Research and Manufacturing Competition Act of 1989, introduced last November by Sen. Ernest Hollings (D-S.C.).

The committee sent the bill to the full Senate for debate and a possible future vote, but indications are that opposition to the bill is already mounting. Even if the bill is not blocked, some senators are calling for substantial modifications.

Under the bill's provisions, RBHCs would have to conduct all manufacturing activities, including design and development, within the U.S. and through separate subsidiaries. The subsidiaries would be subject to Federal Communications Commission audits and public scrutiny. Hollings, who introduced the bill with the hope of spurring U.S. competitiveness, said he wants "made in America" stamped on all RBHC manufacturing.

However, opponents to the bill, including Sen. Howard Metzenbaum (D-Ohio), said it may have antitrust implications. Sen. Lloyd Bentsen (D-Texas) said although he supports the bill, he would like it modified. Bentsen opposes the clause that calls for products to use only American-made components because it could be viewed as a protectionist measure by other nations in trade negotiations with the U.S.

The bill has evoked both strong support and condemnation by industry and government officials in recent hearings.

In his testimony before the Communications Subcommittee earlier this month, FCC Chairman Alfred Sikes called the bill "a positive first step." But he advocated eliminating the requirement that the RBHCs manufacture in the U.S. through separate subsidiaries. Sikes said the RBHCs should not have to face such restrictions.

Sikes said compelling the RBHCs to manufacture in the U.S. would create cost burdens and a "special challenge [because] domestic sources of certain microelectronics are few, if not nonexistent."

At the hearing, Sikes referred

(continued on page 14)

INDUSTRY BRIEFS

Local-area network software giant **Novell, Inc.** last week said earnings soared 78% for its second fiscal quarter, to $20.5 million on revenue of $120 million.

The spurt compares with earnings of $11.5 million on revenue of $110.4 million for the corresponding period in fiscal 1989. Similarly, net income for the first half of fiscal 1990 increased 58% to nearly $36 million, up from the $22.5 million reported for the first six months of fiscal 1989.

Sales climbed 8% in the first half of 1990 to almost $226 million, compared with $209 million for the comparable period in fiscal 1989.

Raymond Noorda, Novell's president, chairman and chief executive officer, attributed the second-quarter results to a continuation of the company's systems-based software strategy.

"The quality of our business, reduced risks and strengthened balance sheets are the tangible results of accomplishing what we set out to do two years ago," Noorda said. "Novell's strategy has stayed right on track as we've moved away from the hardware side of networking to build our success around systems software," he said.

The latest Novell balance sheet also showed that software sales grew to 75% of the company's total revenue, up 3% in the last quarter. During the second quarter of 1989, software sales only accounted for 63%. In addition, Novell's NetWare network operating system sales were also up for personal computer work groups, departmental nets and businesswide information systems.

(continued on page 71)

Bypass by region

Do you currently bypass your local telephone company?
Bypass includes satellite, microwave, and private and local fiber facilities.

RBHC	Yes	No	Plan to	Evaluating
Ameritech	22%	64%	5%	9%
Bell Atlantic Corp.	27	62	5	6
BellSouth Corp.	29	60	5	6
Nynex Corp.	37	51	5	7
Pacific Telesis Group	22	64	3	11
Southwestern Bell Corp.	27	61	2	10
US West, Inc.	18	73	2	7

Figures are based on a survey of 500 user organizations.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: TFS, INC., WESTFORD, MASS.

Bypass competition forces RBHC changes

As alternative access carriers snag users, RBHCs take number of steps to maintain installed base.

By Bob Brown
Senior Editor

Competition from alternative access carriers — and their increasing ability to lure big-name customers — is forcing RBHCs to respond to user demands, industry observers said last week.

The success bypass carriers are having at luring customers to all-fiber digital networks has prodded the regional Bell holding companies to accelerate upgrades to their nets, roll out new services, lower prices for high-speed private-line services and slash order-to-installation delays, industry watchers said.

"I see the RBHCs reacting to customer demand, but I also see them reacting to the threat of competition," said Michael Raber, an Englewood, Colo.-based consultant whose clients include the United Bank of Denver.

One clear sign that alternative access carriers are putting pressure on the RBHCs is that the Bell companies are scurrying to add fiber to their nets in an effort to bolster line quality and provide network redundancy — features the bypass carriers tout with their own fiber nets, said Mark Lowenstein, a telecommunications analyst at The Yankee Group, a market research firm in Boston.

RBHCs have been installing fiber for years, but "there's no question that the RBHCs have been forced by alternative access carriers to improve the quality of their networks, mainly by installing fiber rings," Lowenstein said.

Two weeks ago, for instance, US West, Inc. unveiled a pair of fiber-based net services designed for disaster recovery purposes ("US West unveils new 'self-healing' services," *NW,* May 21).

That followed a Nynex Corp. announcement earlier this month that it would provide alternative routing for its Superpath fiber lines and a Pacific Bell advertising campaign trumpeting the benefits of new fiber rings in Los Angeles and San Francisco. In April, Ameritech said it will invest $100 million to build fiber rings in the large cities it serves.

All seven RBHCs are facing growing competition from alternative access carriers, many of which operate fiber nets. Bypass carrier executives cited "a definite correlation" between where the RBHCs are planting new fiber and where the alternative access carrier nets are located.

> Bell companies are scurrying to add fiber to their nets in an effort to bolster line quality.
>
> ▲▲▲

But most RBHC executives denied that their companies base business decisions on what the competition is doing. Instead, they described such new "business continuity services" and net upgrades as being in response to overwhelming customer demand, falling fiber prices and a series of high-profile, network-crippling disasters.

In findings submitted to the Federal Communications Commission, RBHC executives estimated their firms lost a combined $3.4 billion in revenue to bypass carriers last year, an acknowledg-

(continued on page 14)

Bypass competition forces RBHC changes

continued from page 13

ment that alternative access providers are cutting into their revenue stream.

"Customers in any market are going to use whatever leverage they can with all of their vendors," said Bill Comerford, area manager for Illinois Bell Telephone Co. in Chicago. "That's what competition is all about."

According to Liza Draper, program director at Gartner Group, Inc.'s Washington, D.C. office, the RBHCs have responded to competition with aggressive pricing strategies. "There are plenty of examples of RBHCs lowering T-1 tariffs or retariffing other existing services," she said.

Royce Holland, president and chief executive officer of Metropolitan Fiber Systems, Inc. (MFS), an alternative access carrier with networks in eight cities, said his company has repeatedly faced price competition from the RBHCs.

For example, in December 1988, shortly after MFS announced it would build a network in Minneapolis, US West had a tariffed interstate T-1 rate of about $481 a month, Holland said. Since then, US West's T-1 prices have dropped 23% to about $371 and will fall even lower if US West's latest tariff filing is approved, he said.

George Pfister, director of network strategy at Laventhol & Horwath, a New York-based accounting and management consulting firm, added, "It only took a minimum amount of competition for the RBHCs to become more responsive."

One of the most positive responses of the RBHCs to competition has been shortened order-to-installation intervals — called provisioning — for service orders, Lowenstein said. "Customers have been complaining for years about slow [local exchange carrier] service," he said.

Several RBHC executives acknowledged that their companies have responded to competition by improving their provisioning of high-speed private network services.

"We've done quite a bit to shorten provisioning intervals as a direct result of the alternative carriers getting into the market," said Jerry Parrick, general manager of Pacific Bell's data communications group in San Ramon, Calif. Pacific Bell has clipped the time it takes to deliver T-1 and T-3 services from about 30 days to about seven days, he added.

US West has also responded to competition by cutting its provisioning intervals, according to Holland. He said US West's promise to install its new fiber disaster recovery services in nine days or less is in line with MFS' strategy to deliver service in seven to 30 days.

According to Barry Gilbert, a principal at TFS, Inc., a market research firm based in Westford, Mass., moves by the RBHCs to match the services offered by their competition is a sign that "the RBHCs have made the connection between the long-distance industry and the local loop, and they are making changes to keep their installed base from eroding."

Senate committee passes RBHC bill

continued from page 13

to AT&T, saying that it manufactures none of its customer premises products for residential customers in the U.S.

He said he assumed this was because AT&T "found it difficult to produce such products at competitive prices." He added that the RBHCs should not have to face "an obligation not placed on other U.S. communications equipment manufacturers."

Hollings said he wants to set up RBHC subsidiaries to alleviate concerns about cross-subsidization. But Sikes maintains that RBHCs should be given the freedom to operate like any other company.

"While I appreciate the concerns that gave rise to the current bill restrictions, I am concerned they could mandate treating Bell companies differently from the firms with which they would compete in manufacturing," Sikes said when testifying during a recent committee meeting.

Sikes assured Congress that if the RBHCs are allowed into manufacturing, the FCC will protect the ratepayer and manufacturing competitors through regulatory oversight.

Representatives from the North American Telecommunications Association (NATA), the Telecommunications Industry Association and the Consumer Federation of America questioned whether the FCC was willing or able to monitor the RBHCs' activities. They commented that the FCC does not currently exercise its regulatory oversight sufficently, and they questioned how successful the FCC would be in taking on more responsibilities.

Albert Kramer, speaking for NATA's 350 customer premises equipment manufacturers and distributors, said the Hollings bill would not enhance U.S. competitiveness because the RBHCs would "turn inward for equipment purchases rather than relying on competitive bidding."

But Stephanie Biddle, testifying for the 60 members of the Computer and Communications Industry Association (CCIA), told Congress that although CCIA did not support total removal of the manufacturing ban, it did favor some changes.

She advocated that the RBHCs be allowed to engage in research and development, retain intellectual property rights, interact with manufacturers during product development, fund product development and produce application software. But her proposal stopped short of allowing the RBHCs to fabricate a product. Biddle said that closer interaction between the RBHCs and purchasers was necessary to create a "meaningful product."

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Worth Noting

"The best telecommunications project managers don't walk away from the project the minute it's over; they summarize results and write a final report that explains whether or not goals were met."

Stanley Kroder
Telecommunications management program director
Graduate School of Management
University of Dallas
Irving, Texas

Carrier Watch

AT&T last week announced an engineering consulting service designed to help users optimize the performance of their T-1 networks by demonstrating how to better synchronize them.

Synchronization Design and Update Service benefits users with three or more private branch exchanges or intelligent T-1 multiplexers networked using digital links.

Each device is governed by an internal clock that enables it to send and receive voice and data at exactly 1.544M bit/sec. Accurate transmission requires each clock to run at the same frequency so the components in a private net are set to follow one clock.

With Synchronization Design, AT&T engineers use an AT&T Bell Laboratories-developed expert system to prepare two plans for users. The first plan details the highest level of performance customers can maintain by adjusting their network timing. The second plan represents the optimum design plan possible.

Synchronization Design and Update Service will be available in the third quarter. Plan design and first-year support costs $2,850 plus $985 per digital PBX and intelligent T-1 multiplexer. Design maintenance after the first year will cost $125 per month plus $18 per month for each PBX.

Congress mulls legislation protecting caller privacy

Bill would restrict usage of caller information.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Corporations that collect caller information over telephone nets with features such as automatic number identification could be restricted in how they use the information if Congress moves forward with a pending bill.

Rep. Bob Wise (D-W. Va.), the sponsor of a bill titled The Data Protection Act of 1990, said at a recent hearing that some corporate data collection practices raise privacy concerns. Currently, no laws protect personal information such as credit card purchases, point-of-sale transactions, travel plans or information collected via 800, 900 or other phone services.

Wise, who chairs the Government Information, Justice and Agriculture subcommittee of the U.S. House of Representatives, is proposing the establishment of a federal Data Protection Board, which would be a three-member independent agency of the executive branch.

The board would not have regulatory authority but could investigate complaints, petition federal agencies to take action against abuses and suggest legislation on the collection, use and transmission of personal information.

The bill may be scheduled for further hearings this year, but it is unlikely to move to the full Congress for a vote before the body recesses in August, according to Bob Gellman, chief counsel for the subcommittee.

Eli Noam, a commissioner on the New York State Public Service Commission (PSC), testified at the hearing in support of the bill. Noam said that during his tenure at the PSC over the last three years, privacy concerns were often overlooked by policymakers.

"I could identify almost 50 privacy issues in telecommunications . . . [but] most of the issues are not dramatic and not likely to get much legislative attention," Noam said.

A federal board could serve as a catalyst to get policymakers thinking about the privacy implications of technology and help formulate national approaches to the problem, he said.

(continued on page 20)

WASHINGTON UPDATE

BY ELLEN MESSMER

Committee gives nod to Barrett renomination. The Senate Commerce Committee has approved the renomination of Commissioner Andrew Barrett to the Federal Communications Commission for a term that will end in June 1995. Barrett still must receive approval by a vote of the full Senate.

FCC denies LECs averaged T-3 rate tariffs. The Federal Communications Commission has rejected the tariffs and conditions filed by the local exchange carriers for averaged T-3 rates and ordered the carriers to refile new T-3 rates within 15 days.

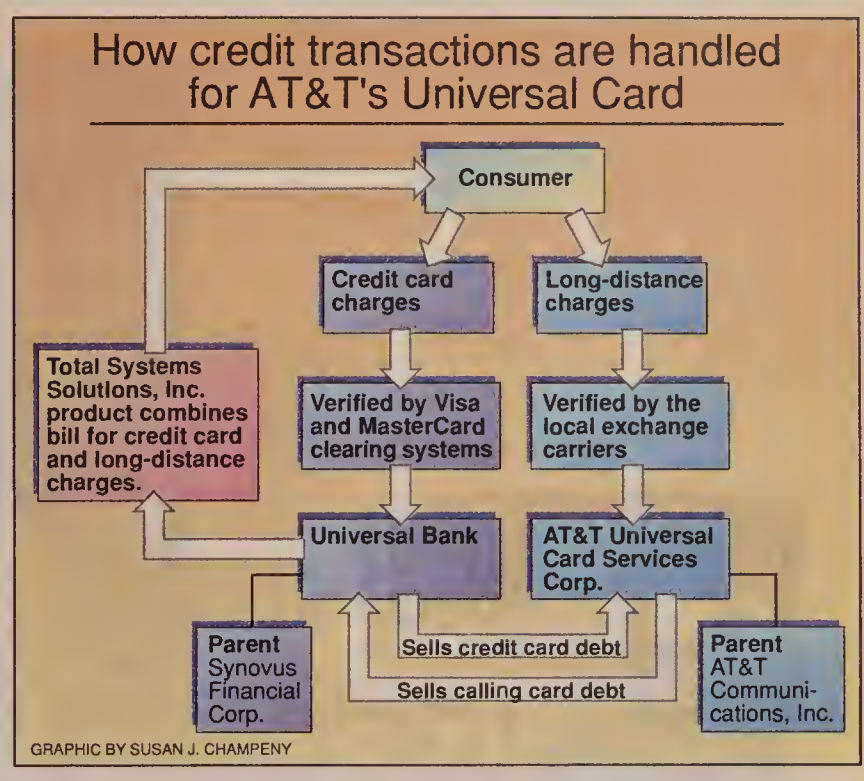
The local exchange carriers filed the averaged rates after the FCC last December found customer-specific T-3 rates to be unlawful and ordered the carriers to terminate existing T-3 contracts and introduce new generalized tariffs.

The new tariffs were rejected last week because the FCC was dissatisfied with certain tariff provisions, including one that would penalize customers for switching to other T-3 providers.

The FCC also said the local exchange carriers were not properly refunding payments users made under individual contracts or crediting those payments to services offered under the new general tariffs.

"The restrictions in these tariffs would withhold from customers the credit to which they are entitled," according to the FCC.

The FCC also rejected arguments made by the Ameritech operating companies that customer-specific T-3 rates filed before March 28, 1988 were not unlawful and ordered the company to amend those arrangements to expire within 15 days.



Banks: AT&T credit card deals unlawful

Claim AT&T is offering illegal, 10% discount on calls made with its combination credit/calling card.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Four banks have launched a legal attack against AT&T, claiming the carrier is violating the law by offering a discount on long-distance calls charged to its combination credit/calling card.

This is the second time AT&T has run afoul of the banking community since the March unveiling of its Universal Card, which is issued as either a Visa card or MasterCard. Citibank, N.A., the U.S.' largest issuer of Visa and MasterCard accounts, switched $30 million of its phone business to MCI Communications Corp. in April.

Now Citibank, along with three other of the nation's largest banks, has filed a formal complaint with the Federal Communications Commission, alleging that AT&T is breaking the law by giving credit card customers a 10% discount on long-distance calls charged to its card.

The four banks — BankAmerica Corp., The Chase Manhattan Corp., Citicorp and MBNA America Bank — say AT&T is violating the Communications Act of 1934 by singling out its credit card customers for special discounts on standard long-distance service. The four banks are asking for unspecified damages.

AT&T officials say the charges are groundless. AT&T Communications, Inc., the telephone unit, is not providing the discounts on long-distance service, according to Peter Gallagher, senior vice-president of corporate and consumer affairs at AT&T Universal Card Services Corp., a subsidiary of AT&T that handles the credit card operation.

The discount is being offered by Universal Bank, a Georgia bank created by parent Synovus Financial Corp. to handle AT&T's credit card operation, he said.

But the four banks claim in the FCC complaint that AT&T indirectly offers the discount through a web of financial transactions designed to funnel money back to Universal Bank as a reimbursement for the 10% discount on long-distance service.

The banks claim AT&T indirectly offers the discount through a web of financial transactions.

▲▲▲

At the end of each day, AT&T's credit card unit buys from Universal Bank all the credit card debt over a predetermined amount. AT&T stands to make a profit on some of that debt, since not everyone will pay off their monthly charges and AT&T will be able to collect a finance charge. Universal Bank also buys debt from AT&T's long-distance service.

In the FCC complaint, the banks claim AT&T is either buying the debt for an amount over its face value or selling the long-haul charges to Universal Bank at a premium to cover the cost of the

(continued on page 20)

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Because we engineer both the hardware and its operating software, Macintosh runs with the smooth speed and precision you'd expect from any perfectly integrated design.

And because Macintosh isn't a "graphical" shell grafted on top of a character-based system, it doesn't expend lots of expensive computing power trying to do something it wasn't designed for.

Which is why, for less than it usually costs to buy the software and the high-end hardware needed for a Mac look-alike, you can have the true article.

Instead of making do with a handful of graphicized programs, you can choose from the thousands of highly innovative business appli-

**The figures don't come from us. They're from a 1990 study conducted by Diagnostic Research, Inc., among* Fortune 1000 *MIS managers and business computer users. Call and we'll send you a copy!*

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cations developed specifically for Macintosh over the last seven years. And instead of patiently following the long path from yesterday's MS-DOS to Windows in the interim and to OS/2 in the someday, you can make one simple step to Macintosh.

The benefits of that step, according to a new independent study* by Diagnostic Research, Inc., are considerable.

It seems people prefer a machine that works like people do. And they get more done with it: Users rated Macintosh 14% higher for overall satisfaction and 13% higher for performance than for PCs running Windows. Which, according to information managers in the same study, translated into productivity ratings which were 32% higher.

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Congress mulls legislation

continued from page 17

David Flaherty, a professor of history and law at the University of Western Ontario in London, agreed that Congress should act now to shape data collection policies before technology races so far ahead that it is impossible to control.

He pointed out that credit card companies, banks and government agencies maintain enormous amounts of personal information on people. Already, the five largest consumer credit companies in the U.S. maintain records on an average of 120 million consumers, Flaherty said.

Jerry Saltzgaber, chief executive officer of Citicorp Point-of-Sale Information Services, disagreed, saying Congress should not impose a heavy-handed bureaucracy on the collection of data. Instead, the industry would be better off policing itself and allowing customers to prohibit the disclosure of their information from one company to another, he said.

Another responsibility of the board would be to assist U.S. companies doing business overseas in complying with foreign data protection laws. Many industrialized countries, including Australia, Austria, Canada, France, Ireland, the Netherlands, Norway, Sweden, West Germany and the U.K., have data protection laws, Wise said at the hearing.

"If the United States is perceived to have inadequate data protection laws, then the consequences for American banks, credit companies, travel agents, communications companies and other businesses with multinational interests could be significant," Wise said.

Noam agreed that U.S. companies could be shut out of international markets such as remote-access data processing and on-line publishing if data protection laws in this country don't keep pace with the rest of the world.

AT&T credit deals unlawful

continued from page 17

10% discount to the bank.

"AT&T directly or indirectly provides . . . benefits to Universal Bank [which] may include purchases or sales of consumer indebtness on terms especially favorable to the bank," the banks said in their complaint. Such benefits "are in whole or in part compensation or reimbursement [for the loss] that Universal Bank absorbs or pays for the 10% discount," the complaint stated.

If AT&T is indirectly providing the discounts, the banks claim it is operating illegally because the carrier has no tariff outlining the discount and is discriminating against other long-distance customers who are not AT&T credit card holders.

If AT&T is indirectly providing the discounts, the banks claim it is operating illegally.

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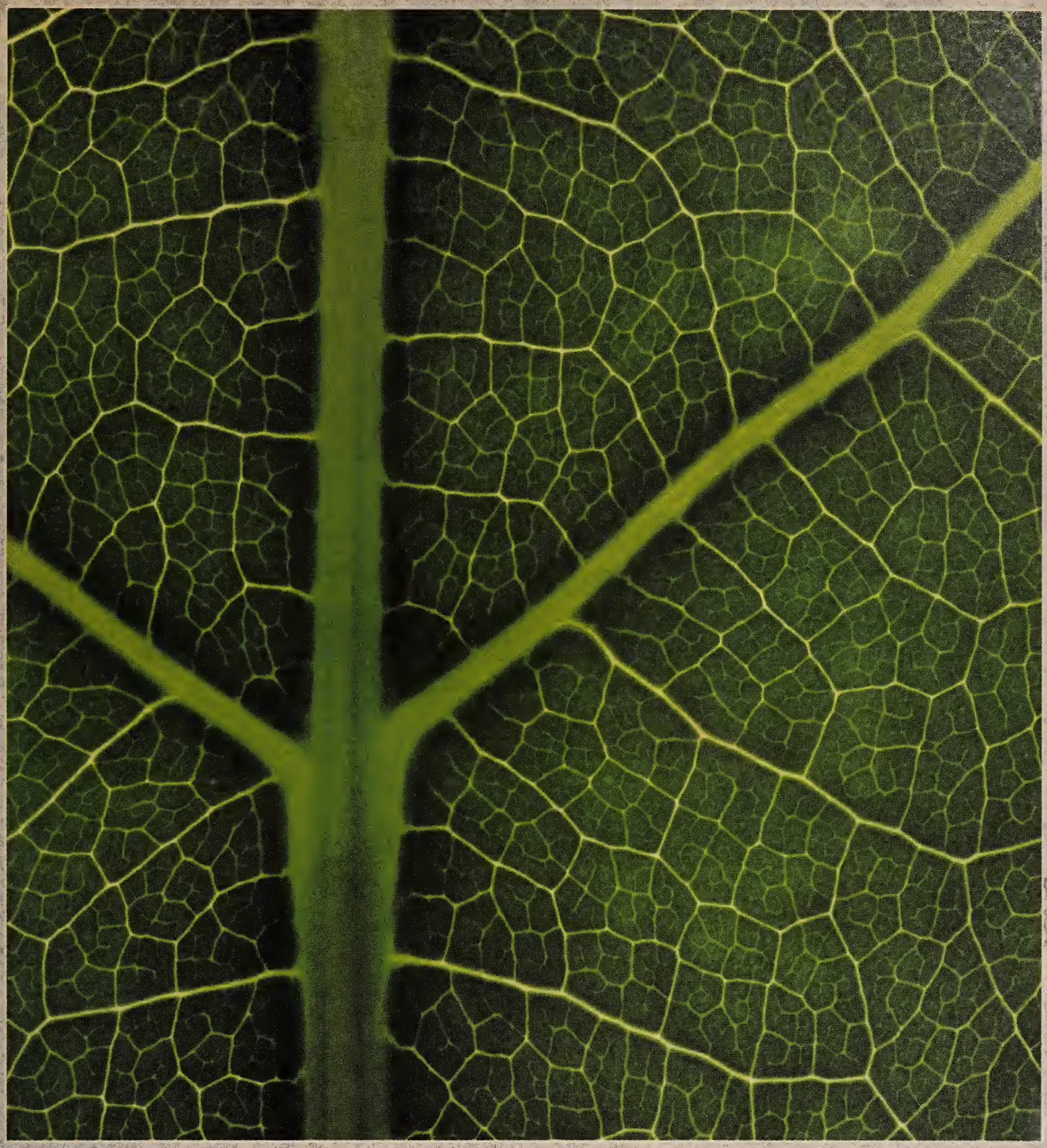
"AT&T is fully responsible for the discount, which it undertakes to provide to its credit card users, regardless of the shell under which it attempts to conceal its responsibility," the banks said.

Gallagher acknowledged that AT&T has an agreement with Universal Bank to sell it all calling card debt and to purchase all consumer debt above a set amount, but he denies that AT&T is buying the debt at a premium.

"When customers make long-distance calls and charge them to their AT&T Universal Card, those calls are billed at the full tariffed rate and that [debt] is purchased for face value," Gallagher said.

AT&T is in no way subsidizing the 10% discounts on long-distance calls, he said. The charges the banks are raising are to be expected since AT&T has an "innovative product" that has proven to be very successful, he said.

"We did our homework with respect to regulatory bodies, and I can assure you that we're confident from our review that the AT&T Universal Card complies with all the applicable laws and regulations," Gallagher said.



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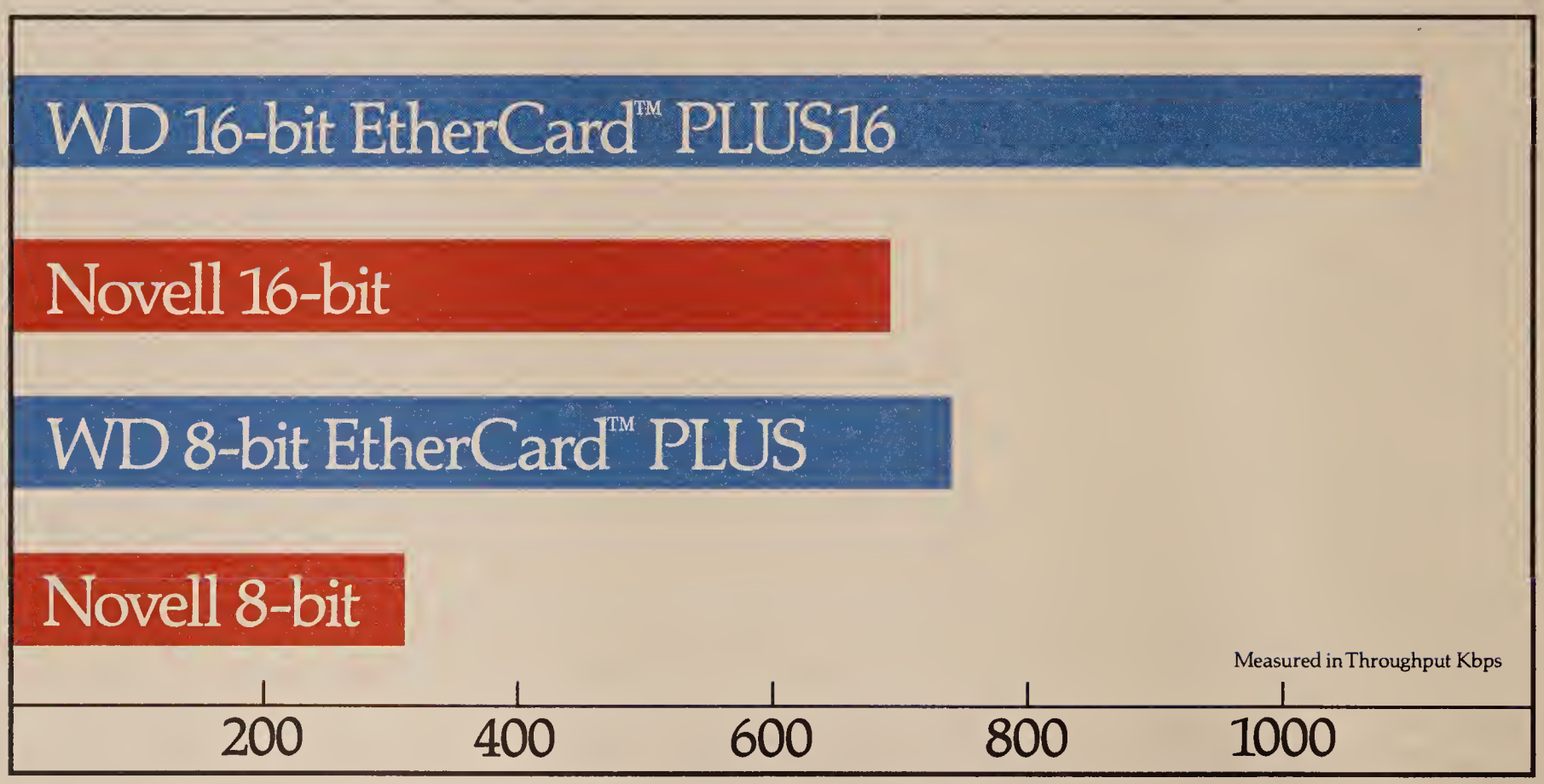

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DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

Western Union Corp.'s Western Union 400 and MCI Communications Corp.'s MCI Mail XChange 400 E-mail networks were linked last week via an X.400-based gateway. Thus, users of one E-mail network can now send messages to users of the other.

Data Packets

IBM recently announced enhancements to its Transmission Control Protocol/Internet Protocol software for OS/2, including support for Sun Microsystems, Inc.'s Network File System (NFS) Client function.

IBM's new TCP/IP Version 1.1 for OS/2 adds support for the NFS Client function, which allows other systems running NFS to access data from a workstation running the IBM software.

TCP/IP Version 1.1 for OS/2 also adds an IBM Presentation Manager-based graphical user interface to the TCP/IP Simple Mail Transfer Protocol (SMTP). The interface, dubbed LaMail, isolates the user from having to enter lengthy text commands required by SMTP and instead uses icons.

The new software is expected to be available Sept. 28 and will cost $800. Current users can upgrade to Version 1.1 for $150.

IBM recently introduced two rack-mountable 3174 cluster controllers. The 3174 Models 21L and 21R support up to 32 3270-type devices and up to 24 ASCII devices. Both models also include a token-ring connection and can be attached to an IBM mainframe via either a mainframe channel or front-end processor. The products are scheduled to be available June 29. The 21L costs $13,680, and the 21R costs $10,280.

Planning phases for linking LANs

Steps for Fortune 1,000 MIS organizations to follow when interconnecting LANs

1990 — Phase 1
1. Select which LAN operating systems and LAN technologies, such as Ethernet and token ring, will be supported.
2. Decide if LAN management will be centralized or distributed.
3. Consider a wiring hub to interconnect LANs in a building, manage physical LAN links and support integral bridges and routers.

1991 — Phase 2
1. Select transmission options such as FDDI for campus nets and circuit switched, frame relay or ISDN for long-haul links.
2. Start linking LANs via bridges and multiprotocol routers.
3. Implement X.400 gateways between LAN E-mail packages.
4. Implement LAN management.

1992 — Phase 3
1. Complete installation of wide-area links.
2. Investigate whether to migrate to OSI-based LAN management and routing backbone.
3. Begin planning a corporatewide directory structure.

GRAPHIC BY SUSAN J. CHAMPENY — SOURCE: FORRESTER RESEARCH, INC., CAMBRIDGE, MASS.

Report suggests strategy to link LANs into internet

Forrester report details three-phase WAN plan.

By Jim Brown
Senior Editor

CAMBRIDGE, Mass. — MIS managers in Fortune 1,000 firms should devise a three-year plan to interconnect the growing number of local-area networks across the corporation, according to a recently published report.

In its report titled "New Corporate Networks," Forrester Research, Inc., based here, details the steps that information systems (IS) managers need to take in order to build a so-called LAN internetwork (LIN).

A LIN consists of bridges, routers, a directory service and wide-area links that make users attached to disparate LANs in multiple remote sites appear as if they are connected to one virtual LAN, according to Mary Modahl, director of network strategy research at Forrester.

To build a LIN, IS managers should be prepared to undertake Phase 1 of a three-phase plan. In Phase 1, IS managers compile a list of LAN technologies — such as Ethernet, token ring and LAN operating systems — they intend to support on their LIN (see graphic). This list can then be distributed to departments that will undoubtedly be looking to IS to build LINs that connect the LAN in their department to LANs in other corporate departments, Modahl said.

Also in Phase 1, users must choose which LIN technology, such as bridges and multiprotocol routers, will support interconnections between LANs, and then users must evaluate whether LAN management should be a centralized or distributed function.

"Users are implementing the LAN now," Modahl said. "While they're doing this implementation, they have to be planning their LIN," Modahl said. "Users should not put in LAN elements they feel are going to keep them from effectively implementing a LIN down the road."

In Phase 1, users should also examine whether to install an intelligent wiring hub to interconnect LANs in the same building. Wiring hubs can help a central-site net operator monitor the physical connections to LANs within buildings, Modahl said.

> "Users shouldn't put in LAN elements that are going to keep them from implementing a LIN."

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Additionally, Modahl said users choosing to install a wiring hub must make sure the device will work with the bridges and routers that are being evaluated.

Even while working on the first phase of the plan, some users will have to install a basic LIN and start connecting sites to it on an as-needed basis. "Users will have to piecemeal things together now," Modahl said. "The main thrust of this report is that as users piecemeal, they must at least piecemeal intelligently."

By mid-1991, IS managers should enter Phase 2 of the plan by starting to evaluate wide-area transmission options for supporting LIN traffic. Modahl said users should consider fast packet technology as an alternative to circuit-switched technology.

"What users really need is dy-

(continued on page 24)

Alamo Rent A Car gets edge with net

Firm's far-reaching net gives info on inventory and how long customers have to wait in line.

By Paul Desmond
Senior Writer

FORT LAUDERDALE, Fla. — Alamo Rent A Car, Inc. is increasing its market share at the expense of larger competitors thanks in part to the data it gathers continuously through its international network.

Alamo, which bounded onto the car rental scene 15 years ago with no market share, today is the nation's fifth-largest rental car company.

The company attributes much of the growth to its emphasis on networking, which it uses to provide statistics on vehicle inventory, how long customers wait in line and staffing needs.

In addition, the company has embarked on several long-term projects designed to cut network costs by distributing network computing power. Alamo is also experimenting with an IBM expert system to determine rental prices and is examining radio frequency technology for terminals that would speed customers through the car drop-off process.

Today, Alamo's network is anchored by an IBM 3090/600 at its data center here, not far from company headquarters, according to Thomas Loane, Alamo's vice-president of computer and communications services.

Seven remote IBM 3720 or 3745 front-end processors are linked to a local 3745 via 56K bit/sec lines. Two satellite links support a remote front-end in Honolulu, Loane said. A total of 54 tail circuits, mostly 9.6K bit/sec multidrop private lines, fan out from the remote front ends to support some 2,500 terminals and 800 printers at 135 remote sites.

"Plus, we've got 220,000 travel agent terminals around the world that can talk to us," Loane said. Alamo has links to all the major airline computer reservation systems.

The links to airline reservation networks do much more than provide travel agents with the ability to make Alamo reservations, he said.

Homegrown software tracks car inventory levels at each rental site, then matches them against expected vehicle requirements

(continued on page 24)

User cuts net costs, adds redundancy with Tariff 12

By Paul Desmond
Senior Writer

TROOPER, Pa. — Colonial Penn Group, Inc. has slashed its data networking costs by $250,000 a year with an AT&T Tariff 12 deal that also has increased net redundancy.

The Philadelphia-based insurance and financial services company, has also taken steps to beef up its automated network management capabilities by installing Bytex Corp. matrix switches in two remote sites to help keep user mainframe sessions up in the event of a remote front-end processor failure. The switches can be controlled via IBM's NetView, which runs at the company data center here.

Originally, Colonial Penn had T-1 links from its data center to remote telemarketing, sales and claims handling centers in Phoenix and Tampa, Fla., as well as to company headquarters in Philadelphia, said Steve Clevenger, vice-president of data operations for the company.

When it swapped out the full T-1s for 512K bit/sec fractional T-1 lines, Colonial Penn was able to form a mesh network by running a fractional T-1 link between Phoenix and Tampa, and still cut costs by $250,000 annually.

"We're getting more redundancy, and we're actually saving money doing it," Clevenger said.

The T-1 net had also supported voice channels, which, as part of the Tariff 12 deal, now run over an AT&T Software-Defined Network (SDN). The switch to SDN cut voice networking costs by 30% to 40% per year.

Colonial Penn has several layers of backup for the T-1 links that provide access to AT&T's fractional T-1 service. The company uses Bell Atlantic Corp. and Eastern Telelogic Corp., a fiber bypass carrier, to supply T-1 links from here to Philadelphia over mutually exclusive paths. Likewise, the company uses two carri-

(continued on page 24)

Alamo Rent A Car gets edge with net

continued from page 23

based on reservations made by travel agents and by Alamo itself, Loane said. The system helps estimate — by looking at flight data, including delays or cancellations — which customers may keep cars longer than expected and which customers may not show up. Then, Alamo transfers cars by truck to meet the demand.

"We have reduced the number of times that we have been unable to serve a customer [with a reservation] by 75% in the last two years," he said.

Alamo also uses its network to determine staffing needs. Schedules are made in advance, based in large part on rental reservations and airline flight bookings, then are reworked on the fly according to what flights arrive early or late, or are cancelled. Also, once a customer enters an Alamo rental center, the company tracks how long each person must wait for service. Alamo enters customer names into a computer when they arrive and notes the time at each step in the rental process to determine peak periods.

That wait is usually minimal because the network helps Alamo speed customers through its large airport and other rental facilities by letting clerks access a centralized data base of all Alamo customers. Pertinent information such as name, address, driver's license number and phone number is stored for 18 months for each customer so clerks do not have to reenter data for every rental. That not only wins points with renters, but it cuts Alamo's costs by making clerks more productive.

In addition, response time between terminals at major centers and remote hosts is generally less than three seconds, Loane said. It is under two seconds at rental counters in large cities and less than three seconds at Alamo's smallest locations.

Alamo is working to improve its rental pricing procedures using a prerelease version of an IBM tool dubbed The Integrated Reasoning Shell (TIRS), which is part of IBM's AD/Cycle application development package. The company is testing TIRS for an application that sets Alamo car rental pricing by looking at what competitors are charging through prices posted in various airline systems. That helps Alamo position cars in two markets — for customers that want the least expensive car available and for those that want a particular car and are willing to pay more for it.

Loane said the system is not in production yet and would not give further details on it except to say, "It's providing tremendous value to us now."

Later this year, Alamo will also roll out radio frequency terminals at some airports to speed customers through the drop-off process. Instead of going to a rental office, customers can enter data such as the mileage and fuel level on the terminal, get their receipt and leave. Alamo also plans to use the terminals for applications such as taking auto inventory, tracking which cars need repairs and, for security reasons, tracking which cars leave the lot.

Report suggests strategy to link LANs

continued from page 23

namic bandwidth allocation," Modahl said. Fast packet technology can assign the type of bandwidth needed to support the burst-like nature of LAN traffic over long-haul T-1 links.

Modahl also said users should examine Integrated Services Digital Network services as an alternative to leased lines between sites that do not have enough LIN traffic to justify a T-1.

Also in Phase 2, users should implement X.400 gateways between the various LAN-based electronic mail packages at different sites and begin to implement the LAN management plan devised in Phase 1.

By the start of 1993, users should be ready to enter the third and last phase, in which they will implement the plans developed in Phases 1 and 2, Modahl said. Users should also begin investigating whether Open Systems Interconnection standards can be used to replace the multiple protocols being used on LANs and the LAN management scheme devised earlier.

Lastly, users should plan how to implement a corporatewide directory service. This will list all the users on LANs attached to the LIN, which is a private network.

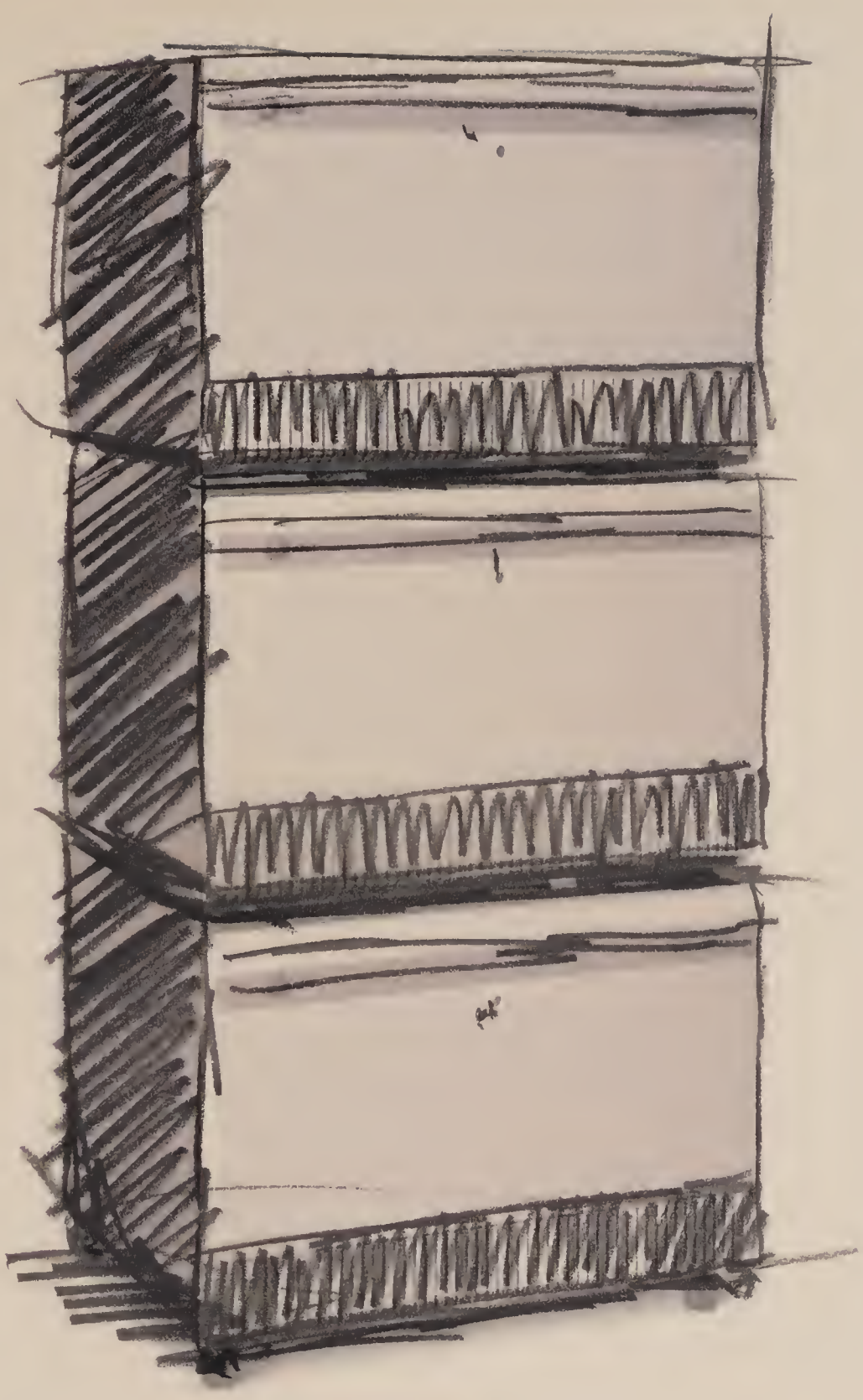
User cuts net costs, adds redundancy

continued from page 23

ers to link its Tampa site to AT&T's point of presence there and is thinking about installing a microwave link in Phoenix to augment the T-1 it leases from US West, Inc., the only carrier available in that area.

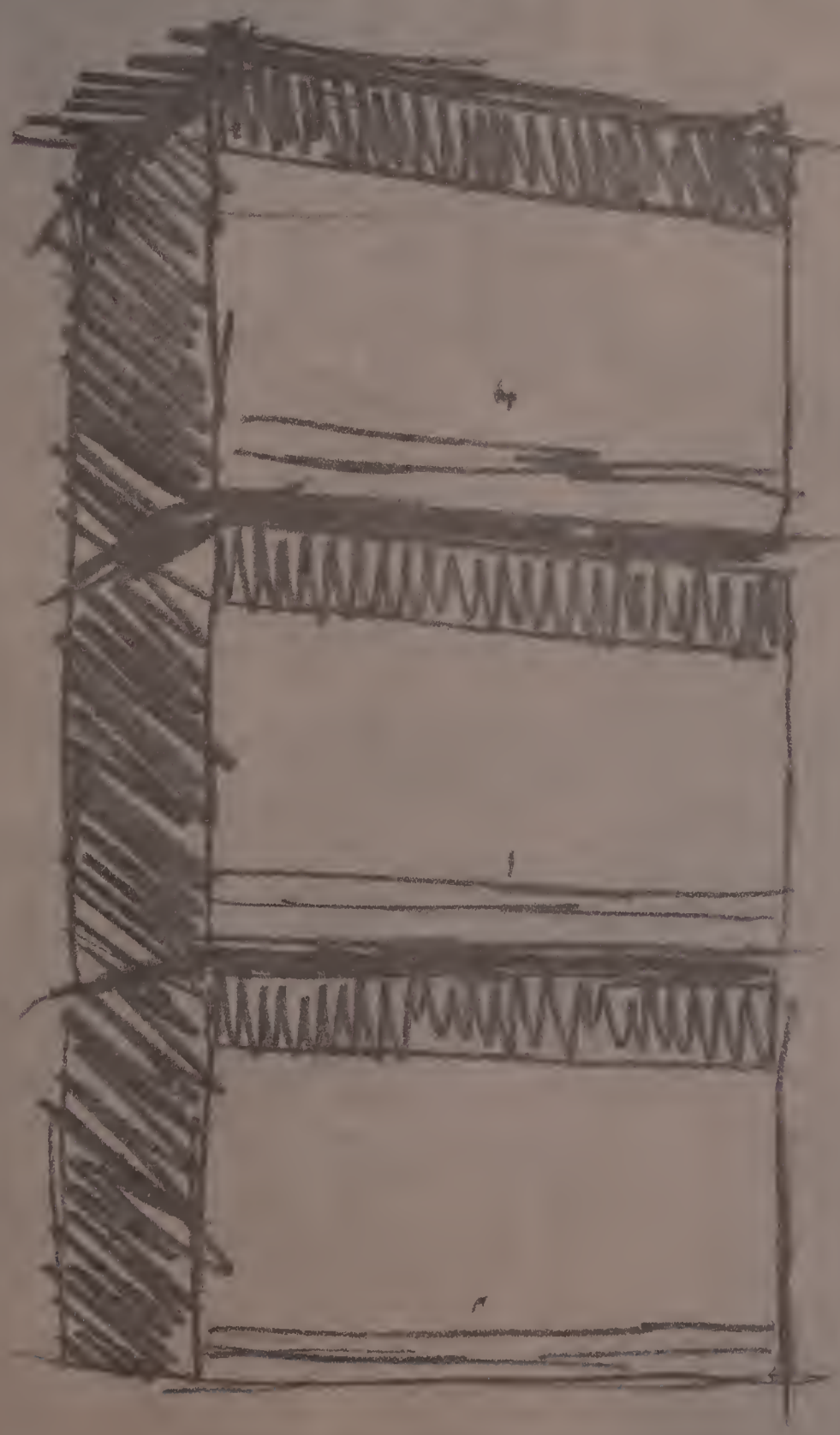
It also uses two channels off the SDN net to provide dial backup to AT&T for its data circuits. "We're able to use two channels on our voice T-1 where prior to that we had to dedicate two [AT&T] Switched 56 access lines. That was costing us $100,000 a year," Clevenger said.

At both its Tampa and Phoenix sites, Colonial Penn has installed a Bytex Unity 10 matrix switch and Bytex's Unity Network Link, which gives NetView control over the switches. At each site, a total of 12 to 14 IBM 3174 cluster controllers are linked to one of two IBM 3720 front-end processors via the Bytex Unity 10. In the event one of the 3720s fail, all the 3174s can be switched automatically by NetView to a single 3720, which can support all the terminal users, albeit with degraded performance. The switch takes place without human intervention and without disrupting user sessions, Clevenger said.



How everyone else gets their great ideas.

How everyone else gets their great ideas.



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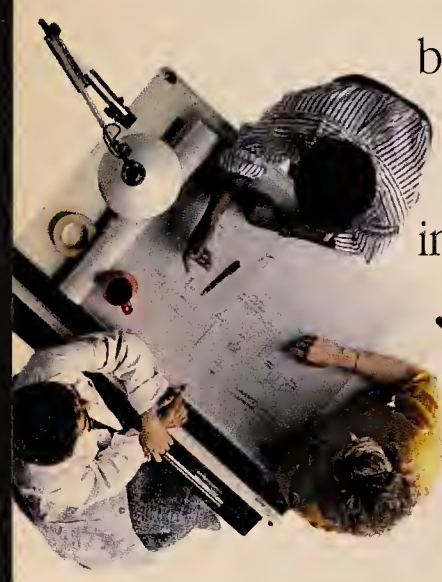

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Worth Noting

"Our request for the fourth seat on Lotus' board wasn't exactly a reaction to the shareholder suit. The difference in market value between the two companies was so slight that we thought we should have equal representation on the board."

Raymond Noorda
President, chairman and chief executive officer
Novell, Inc.
Provo, Utah

Netnotes

Palindrome Corp. this month is expected to release a version of its tape backup software, The Network Archivist (TNA), that can back up and restore bindery files in Novell, Inc. NetWare 386-based networks. Other enhancements include date-range restore capability, faster retrievals and improved documentation.

Version 1.7 of TNA will let network administrators restore NetWare 386 bindery files, including user and group security definitions, when restoring files from tape. Bindery files are at the heart of NetWare's security system, controlling user and group lists, rights and passwords.

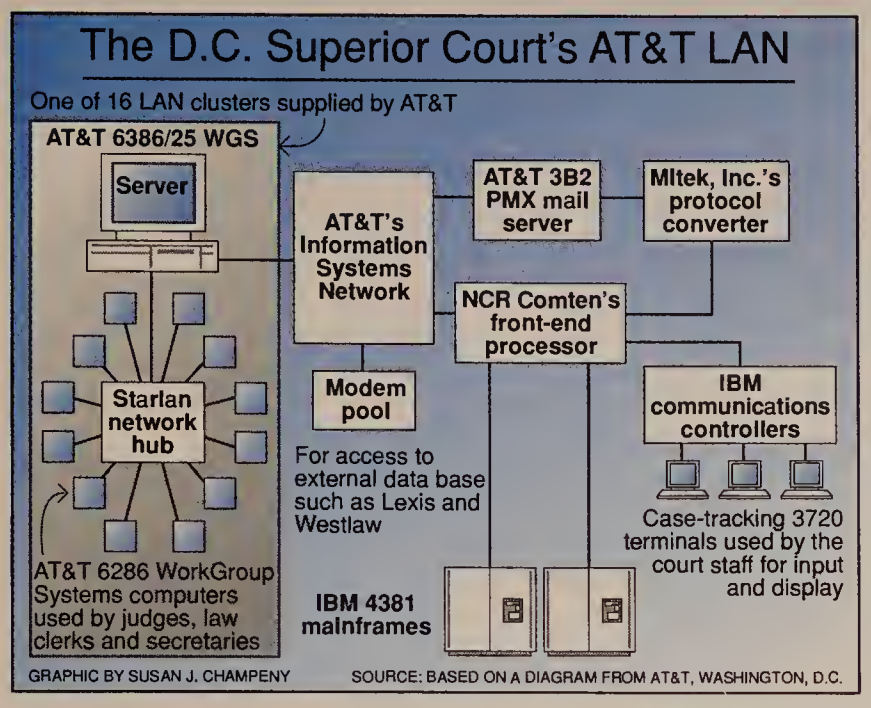
The software also backs up and restores NetWare 286-compatible file flags such as "read-only" or "shareable," as well as trustee rights granted at the directory level.

The new TNA version has a feature that can bring back the latest version of a file, a group of files or an entire volume within a date range set by a user.

For example, if a virus hits a local net on April 4, 1991, TNA can restore the versions that existed between Jan. 1 and April 3, 1991.

Another new feature is a pop-up window that appears to warn users when they stray

(continued on page 26)



Court looks to AT&T LAN to speed up due process

Superior Court's net links judges and law clerks.

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — The Superior Court of the District of Columbia hopes to speed up the legal process by bringing 51 judges on-line with a local-area network provided by AT&T Computer Systems.

The Superior Court, which handles 200,000 civil and criminal cases each year, will use the LAN to facilitate communications between judges, law clerks and secretaries who work together to complete documents such as defendants' court orders.

The network is being provided under an $834,000 contract awarded last January to Business Equipment Center, Ltd., an AT&T value-added reseller based here.

The contract calls for the installation of 196 AT&T 6286 WorkGroup Systems (WGS) personal computers for use in judges' offices, 16 6386/25 WGS workstations acting as file servers, 58 AT&T 593 laser printers and an AT&T 1M bit/sec Starlan network.

The workstations will be supported on 16 LANs, half of which are now on-line and the remainder of which are scheduled to be up by August.

AT&T Computer Systems will provide technical support to interface the LANs to the court's existing fiber-based backbone, an AT&T Information Systems Network.

Judges were catalyst

David Kelly, the Superior Court's assistant director of data processing, said judges' demand for greater connectivity spurred the court's DP department to install the LAN. Some judges even want to bring the system right into the courtroom, where decisions made in court cases could be instantly keyed into a computer, he said.

One judge's secretary, in a chamber which is on-line, said the LAN is a great improvement over the old system in which Sony Corp. personal computers were hard-wired to a mainframe.

Now, before a court order is issued in a defendant's case, revisions can be made more easily as the deciding document is fine-tuned to fit the crime. The judge, law clerk and secretary, all having input into the process, are now able to exchange draft documents via the LAN and leave each other messages via electronic mail rather than walking floppy disks from desk to desk and relying on paper messages.

> The judges' demand for greater connectivity spurred the court's DP department to install the LAN, said the Superior Court's Kelly.
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The LAN simplifies logon procedures by automating many of the steps necessary to access the court's mainframe data base for information related to civil or criminal cases, or to access external Lexis and Westlaw data bases used by law clerks and judges.

Judges will also be able to exchange E-mail messages with other judges and their staff as the clusters are established.

Mgmt. tool controls LAN program usage

Product protects against viruses, net abuse by regulating use of software on client workstations.

By Susan Breidenbach
West Coast Bureau Chief

CLEVELAND — A small software company here is taking a rather unique approach to network management and security. It views local-area network users as "two-legged viruses" that can be more dangerous than the malicious programs dreamed up by hackers.

To help network administrators contain this threat, FoundationWare Corp. last year decided to take its flagship Certus product, a security and recovery utility for stand-alone DOS computers, and turn it into a network management tool for LANs.

The result, called Certus LAN, attempts to protect users from themselves — and from computer viruses — by controlling the execution of software in individual network clients. The LAN administrator can set up separate profiles for each user or group of users, or it can establish a single profile for the entire network.

The profiles, stored on the network server, determine which programs and data files users can load from local hard or floppy drives. They can also be used to prevent users from copying programs or data from the server to their local drives.

"We don't compete with products like [Network General Corp.'s] Sniffer, which help you manage devices," said Peter Tippett, founder and chief executive officer of FoundationWare. "Certus is for managing people problems."

> "Certus is for managing people problems," Tippett said.
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Certus LAN consists of server software, which contains user profiles defining access rights to shared resources, and a 10K-byte memory-resident program that

(continued on page 26)

Unisys 80486-based server, local net products debut

By Paul Desmond
Senior Writer

NEW YORK — Unisys Corp. recently unveiled a bevy of local-area network products, including a high-end server in its Personal Workstation² (PW²) line, the company's first server based on the Intel Corp. 80486 microprocessor.

Other products announced include two Intel 80386-based machines, one configured as a server and the other as a workstation, and a diskless Intel 80286-based workstation that offers the performance of a 386 machine.

The announcements are part of a push by Unisys to garner a larger share of the LAN market by offering an open computing architecture, meaning the products are designed to work with hardware and software from a range of vendors.

Unisys also announced a personal computer product compatibility testing lab and a suite of LAN management services.

Unisys extended the PW² family with the introduction of its most powerful personal computer to date, the PW² 800/486-25A. Based on a 25-MHz Intel 80486 microprocessor, the machine doubles the processing speed previously available on Unisys personal computers.

The PW² 800/486-25A comes with 8M bytes of random-access memory and is expandable to 32M bytes of RAM. It also has an integral floating point processor and 8K bytes of cache memory, which allows users to boost performance without add-on facilities.

A number of software environments are supported, including MS-DOS, OS/2, Novell, Inc.'s NetWare and Microsoft Corp.'s Windows/386 and LAN Manager.

In addition, the machine can be used as a multiuser system running The Santa Cruz Operation, Inc.'s Unix or Microsoft's Xenix.

(continued on page 26)

Banyan trade-in program lets users migrate to VINES

By Laura DiDio
Senior Editor

WESTBOROUGH, Mass. — Banyan Systems, Inc. earlier this month announced a trade-in program that enables U.S.-based network users to exchange their existing network products for a cash credit toward the purchase of Banyan's VINES network operating system.

The program, called Upgrade Your NOS to VINES, lets existing Novell, Inc. NetWare, 3Com Corp. 3+Share, IBM PC Network, Corvus Systems, Inc. PC NOS and DSC Communications Corp. NEX/OS users trade in these operating systems for a cash credit of up to $3,500.

The versions of VINES covered under the program are: VINES/386, VINES/486 and the entry-level 10-user version, VINES/386 Team, according to James Allchin, Banyan's vice-president and chief technical officer.

"In many cases, our trade-in allowance will equal the original purchase price of the users' current network operating system software," Allchin said.

The actual amount of the credit depends on the respective acquisition costs of the network operating system and the particular version of VINES that the user selects, he said.

> "In many cases, our trade-in allowance equals the original price of the users' current net OS software."
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The credit allowances are as follows: $595 for 3+Share 5User; $695 for NetWare ELSI and PC/NOS; $995 for 3+Share Entry; $1,040 for PC Network; $1,895 for NetWare ELSII; $2,295 for DSC NEX/OS 286; $2,995 for NetWare ADV and 3+Share; $3,295 for NEX/OX 386; and $3,500 for NetWare SFT and NetWare 386.

Allchin said Banyan is offering two tiers of incentives for users with large networks that want to migrate to VINES.

For networks with five to nine servers and networks of 10 or more servers, Banyan is offering "significant discounts" on all software options, according to Allchin. He declined to give exact numbers, saying the discounts will be based on a customer-to-customer basis.

Allchin said Banyan will implement a similar program for its international customers next month.

For more details, contact Banyan's telemarketing department at 115 Flanders Road, Westborough, Mass. 01581, or call (800) 828-2404.

Unisys 80486 server debuts

continued from page 25

The device, which supports Ethernet or token-ring LANs, allows workstations to access Unisys 1100/2200, A Series and System 80 hosts, as well as IBM Systems Network Architecture or Binary Synchronous Communications hosts.

Available in June, pricing for PW² 800/486-25A starts at $10,795.

Unisys' two new 80386 machines are the PW² 800/33A server and the 500/20A workstation.

> Unisys' new diskless workstation has a single system board housed in a snap-on module, dubbed a Personality Pack.
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The 800/33A has a 32-bit, 33-MHz 80386DX microprocessor (which is extendable with an Intel 80387 math coprocessor), 24M bytes of memory and supports as much as 640M bytes of Small Computer System Interface (SCSI) disk storage. It works with the same LANs and software as the PW² 800/486-25A.

The PW² 500/20A workstation is based on a 20-MHz Intel 80386DX processor, which is also extendable with the 80387 math coprocessor. It includes 2M bytes of memory, expandable to 10M bytes on the system board. The machine supports 160M bytes of SCSI disk storage and has five expansion slots.

Both systems are available now. A basic 800/33A configuration costs $6,800, and the basic 500/20A is priced at $3,795.

Unisys' new diskless workstation, the PW² LAN Workstation/286, has a single system board housed in a snap-on module, dubbed a Personality Pack, that attaches to the back of the system's video graphics adapter monitor.

The board includes a 10-MHz Intel 80286 microprocessor, 1M byte of system memory (expandable to 5M bytes) and an eight-bit Ethernet interface.

Implementing all these components on a single board provides performance improvement by eliminating the need for an internal bus, which creates a bottleneck in the data flow, Unisys said. The company claims the machine outperforms other vendor's 80386-based systems.

The Personality Pack reduces the footprint of the PW² LAN Workstation/286 by moving components such as the processor and Ethernet circuitry to the back of the video screen as opposed to within the chassis.

Unisys intends to add features to its Personality Pack that will let users run simultaneous sessions of MS-DOS, OS/2 and Unix applications.

Future Personality Packs will also support NetWare, IBM's Token-Ring Network and OS/2 LAN Manager, Unisys said.

The existing Personality Pack is included in the $2,395 price tag for the PW² LAN Workstation and is available now.

Unisys also announced it has inaugurated a personal computer product compatibility test lab to ensure interoperability of its PW² series with hardware and software from multiple vendors.

Advisories with test results are sent to division marketing managers for distribution to the field, and the sales force can access an on-line product information data base to keep up to date on which products have been tested with the PW² Series.

Unisys will also help users plan, install and support their LANs under its new LAN management services program.

Netnotes

continued from page 25

from the automatic tape rotation schedule or try to force a save on the wrong tape. Designed to help users avoid errors, the windows can be overridden.

Version 1.7 of TNA, which is compatible with most 2.2G-byte tape drives, will be available at the end of May. The software costs $1,795, and $1,895 for machines based on IBM's Micro Channel Architecture (MCA). Registered users can get a free upgrade until July 15, 1990.

Complete backup subsystems, including TNA software and a 2.2G-byte tape drive, are priced at $8,695; MCA models cost $8,795.

Palindrome Corp., 850 E. Diehl Road, Naperville, Ill.; (708) 505-3300.

Mgmt. tool controls LAN usage

continued from page 25

runs on each DOS client.

The DOS client program contains a special algorithm that creates a unique electronic fingerprint for each executable file. When a particular file is loaded, the program checks it against its corresponding signature before allowing it to run on a workstation. If a program a user attempts to load has been infected by a virus or is the wrong version of a particular piece of software, it won't match the fingerprint and will not run.

Besides preventing use of programs that have been altered, the client can block users from introducing new programs to the LAN environment by enabling network administrators to establish lists of approved software against which any locally loaded programs must be checked.

"People buy Certus LAN for two reasons," said Michael Riemer, vice-president of FoundationWare. "One is that they are worried about viruses and want a proactive rather than reactive solution. And [the other is that] they want to monitor software use, which is becoming a bigger and bigger proposition as networks continue to grow. Viruses are just a symptom of this larger problem — controlling and monitoring software use."

It was this realization that led FoundationWare to evolve its initial product, a virus prevention program called Corporate Vaccine, first into a stand-alone version of Certus and then into a LAN version, which was released last fall. Certus LAN runs on Novell, Inc.'s NetWare and any Network Basic I/O System-compatible LAN operating system.

Riemer likes to tell of one customer, an international bank, that was convinced its network was infected by a virus because workstation hard disks were constantly crashing. The bank installed Certus LAN to look for the virus and found it was walking around on two legs.

"The cleaning people were coming in at night and running bootleg games that were trashing the computers' hard disks," Riemer said. Once Certus was up and running, the games — which weren't on its approved list of programs — couldn't be loaded.

One company that plans to use Certus LAN's people management capabilities is the *Toronto Globe and Mail,* a daily newspaper in Toronto. The paper has about 1,000 employees and a NetWare LAN.

"We have an awful lot of diskettes moving files in and out of the newspaper," said Kevin Speicher, an information center consultant for the newspaper. Both free-lance reporters and staff writers who work at home have been known to introduce viruses into the company network.

"We're looking to Certus to keep a lid on that, but we also want to use its execution control capabilities to help control copyright violations of the software licenses we have." Speicher said he doesn't anticipate user resistance to the product.

"We see Certus, and the information center in general, as playing a helpful vs. an authoritarian role," he said. "Some of our PCs are in areas where there is a relatively high degree of staff turnover. They have had a number of different owners, and their configurations tend to be a mess."

The paper's information center staff members plan to sit down with users and install Certus as part of a system cleanup and configuration service. "We'll reach an agreement about what should be on a particular system and then put a lock on it," Speicher said.

Where the responsibility will ultimately lie for introducing new software to the network has not been decided yet. "We in the information center don't know if we want to take that on or whether we want to distribute the responsibility to the departments," Speicher said.

> "Viruses are a symptom of a larger problem — controlling software use."
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The different levels of security in Certus LAN enable the network administrator to delegate such authority to selected users.

Version 2.0 of Certus and Certus LAN, released this month, have a virus-scanning feature that can check new software that has not been fingerprinted. According to Riemer, it has the ability to learn new viruses on the fly from infected programs and then use that knowledge to identify the same viruses in other programs.

Other enhancements include a feature that can prevent users from bypassing security by booting a workstation from its floppy drive and then accessing its hard drive. The new version also lets network administrators lock DOS attributes so that users cannot change them to make illegal copies of programs.

Certus LAN is priced at $795, which includes licenses for one server and 10 workstations. Additional workstations can be added in increments of five for $380, and site licenses are also available. Users of Certus LAN 1.0 can upgrade to the new version for $199.95, plus $49.95 for each workstation over 10.

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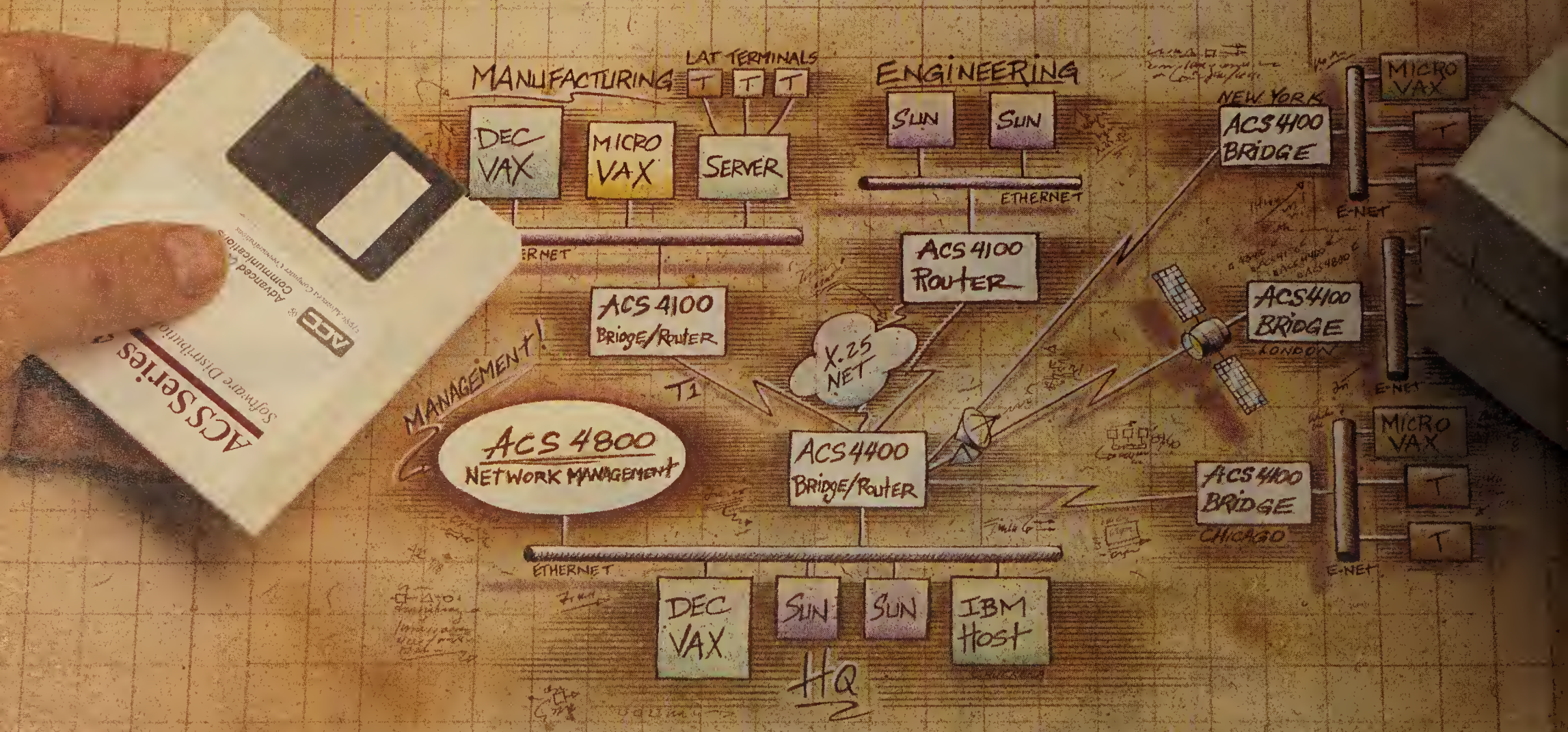

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Dialogue

Do outsourcing vendors represent a threat or an opportunity to network managers?

"Definitely an opportunity. We would like to turn over our backbone network to a vendor sometime in the next 18 months. This would allow our telecom people to focus on developing strategic network applications instead of doing routine operational work, such as installations and network management. We have a growing backlog of network applications that end users want us to develop.

"Unfortunately, most vendors aren't ready to run a backbone network. While they may have a large network control center, they don't have all the necessary procedures in place."

Bernie Schneider
Director of telecommunications
United Stationers, Inc.
Des Plaines, Ill.

"They're not a threat. Because of economies of scale, they represent an opportunity for companies to lower costs.

"However, before companies consider outsourcing, they should first know how to manage their existing vendors. If you can't manage vendors, then an outsourcing arrangement won't work out."

Robert Domanoski
Manager of corporate telecommunications
Ingersoll-Rand Co.
Woodcliff Lake, N.J.

"That's a good question. Outsourcing some components of network mangement could make me look a lot better. Outsourcing can increase service quality and decrease costs. However, we haven't done it yet.

"Once you decide to outsource, it's a long-term commitment. You have to weigh that decision carefully. The big issue we have to address is whether we really want to give up portions of our network to someone else."

William Johnson
Corporate director of telecommunications
F.W. Woolworth & Co.
New York

"Without question, outsourcing presents an opportunity for the simple reason that it

(continued on page 57)

Drills help bank fine-tune net disaster recovery plan

Twice a year, staffers put program into action.

By Wayne Eckerson
Senior Writer

BELTSVILLE, Md. — John Hanson Savings & Loan, Inc. believes that when it comes to managing a disaster recovery program, practice makes perfect.

Twice a year, the federal savings bank, headquartered here, tests the readiness of its information systems staff by simulating a catastrophe that knocks out the bank's central data center here and disrupts communications to the bank's 15 branch offices.

Arthur Hooper

The semiannual tests have enabled data center staff to refine their disaster recovery procedures so they can restore service to the branches in less than four hours and run bank operations from a backup data center for an entire working day.

"The purpose of the tests is to routinize disaster recovery procedures so people don't have to think about what they're doing," said Arthur Hooper, senior vice-president of information and administrative services. "There's so many things going on in a real disaster, no one has time to think — things have to be automatic."

John Hanson Savings has two data centers located about 20 miles apart that are linked to bank branches with a network based on a Doelz Networks, Inc. Esprit fast packet switch and Doelz Elite multiplexers.

The data center here has a Unisys A9 mainframe that handles most of the data processing for the branches. The other data center has a Unisys A4 mainframe and serves only as a development facility and backup site. In addi-

(continued on page 31)

New England researchers team up to access NSFNET

By Wayne Eckerson
Senior Writer

BOSTON — Forgoing federal funds, New England universities and businesses have teamed up to build a regional network that gives academic and industrial researchers high-speed access to the National Science Foundation network (NSFNET) and other Internet research networks.

Established in early 1989, the New England Academic and Research Network (NEARNET) is the latest regional network to be added to NSFNET, a nationwide network that links researchers in more than 600 U.S. organizations. NEARNET is a 10M bit/sec Ethernet microwave backbone that links Ethernets at 46 New England universities, colleges, and business and private research laboratories.

But unlike the 14 other regional or state networks comprising NSFNET, NEARNET is entirely self-supporting and receives no direct funding from NSF or other federal agencies. The costs of building and maintaining the network are borne entirely by members of NEARNET through annual dues, as well as service and installation fees, which are prorated based on the type and size of the institution and the data rate of the network connection.

Since their inception, all regional NSF nets have received NSF funding, but that is likely to change. According to NEARNET officials, NSF is moving to privatize NSFNET.

Dan Vanbelleghem, associate program manager of NSFNET in Washington, D.C., said NSF will probably decide to fund regional nets for a period of five years and after that, those nets will have to find alternative financing methods. For most regional nets, this means their federal funding will dry up in 1992 or 1993.

To avoid the squeeze on federal funding, NEARNET's founders decided to run NEARNET as a business, responsible for generating its own capital and working assets.

"Early on, we realized we couldn't count on federal funds to support NEARNET now or in the

(continued on page 30)

Global IS architectures

Architecture	Data base management/ processing	Data I/O	Network management
A	Centralized	Distributed	Centralized
B	Distributed	Distributed	Centralized
C	Centralized	Distributed	Distributed
D	Distributed	Distributed	Distributed

SOURCE: PRASHANT PALVIA, MEMPHIS STATE UNIVERSITY, MEMPHIS, TENN., AND CHETAN SANKAR, AUBURN UNIVERSITY, AUBURN, ALA.
GRAPHIC BY SUSAN J. CHAMPENY

Mgmt. style dictates form of global nets

Paper says firms should determine architecture for international nets based on corporate structure.

By Joe Panepinto
Special to Network World

Users looking to build global networks can choose one of four major architectural alternatives depending on their preferred style of management, according to a paper by two professors.

The paper, "Architectural Alternatives and Issues in Designing Global Information Systems: Frameworks for Design and Research," was written by Chetan Sankar, an assistant professor in the Department of Management at Auburn University in Auburn, Ala., and Prashant Palvia, a professor in the Department of MIS at Memphis State University in Memphis, Tenn.

Sankar and Palvia defined a global information system (IS) as one that receives input from many countries and produces output to sites around the world. The system includes data input, output, data base management systems, data processing systems and network management.

The professors, however, have combined input and output as one element, and DBMS and DP as another element, reasoning that provisions for these functions are usually made in tandem. Each of the three resultant components — I/O, DBMS/DP and network management — can be centrally located or dispersed in several countries, providing for four major global network architectures.

While I/O is presumed to be decentralized in all four architectures, DBMS/DP and net management can be distributed or centralized as needed (see graphic).

According to Sankar, a former network design specialist at AT&T Bell Laboratories, net managers should determine the final architecture for their global networks based more on their company's preferred management style than on any technological factors.

A company that prefers a centralized management structure should design a global information system that maintains most functions at a central site, while a company that prefers a more loose management matrix should push DP and network management out to different regional units, Sankar said.

"I don't think the technology is a limiting factor," Sankar said. "I think global net architecture is more of a managerial issue."

> "I don't think the technology is a limiting factor," Sankar said. "I think global net architecture is more of a managerial issue."
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"I see that global network design is most often an ad hoc, arbitrary type of process that happens without much planning," Palvia said. "It is a sort of 'do as you go and add pieces to it' approach that results in an unwieldy and inefficient system."

Palvia recommends that users build a comprehensive global net strategy that allows them to distribute or centralize IS functions to fit their management style.

"Some users may have to undo some things they have already done, but that may be more useful in the long run," he said.

Users that have global opera-

(continued on page 31)

Researchers team up to access NSFNET

continued from page 29

future, so we never asked NSF for money," said Kent England, director of networks at Boston University here and one of the three founders of NEARNET.

Evolution of NEARNET

In 1988, Scott Bradner, a network specialist from Harvard University, Jeffrey Schiller, a network manager at the Massachusetts Institute of Technology, and England decided New England needed a network that would interconnect researchers at high-tech firms, universities and colleges in the six-state region.

The three were motivated in part by the fact that the U.S. Defense Department had announced it was dismantling the Advanced Research Projects Agency Network (ARPANET), which many New England schools and businesses relied on to gain access to the Internet, including NSFNET.

In addition, New England didn't have a regional NSF network, which was ironic since the region is one of the heaviest users of NSFNET. Evidently, no organization or group had stepped forward to apply for funding when NSF was putting NSFNET together in 1986 and 1987.

"We knew we needed a strong regional NSFNET in New England and needed it fast since ARPANET was disappearing," England said.

By May, MIT, Harvard and BU each had purchased a microwave transceiver and internetwork protocol routers from cisco Systems, Inc. of Menlo Park, Calif., to link their campuses, all located here. The microwave links later formed the backbone of NEARNET.

The three schools then selected Bolt, Beranek and Newman, Inc. (BBN), a Cambridge, Mass.-based packet-switch vendor and the original designer of ARPANET, to build, operate and monitor the fledgling NEARNET.

The first members of NEARNET, besides the founding schools, were organizations that supported ARPANET: BBN, Digital Equipment Corp., Encore Computer Corp., MIT's Lincoln Laboratories, Mitre Corp. and Thinking Machines Corp. ARPANET chipped in funds to migrate these companies off ARPANET and onto NEARNET.

DEC, Lincoln Laboratories and Thinking Machines were connected to the backbone via 10M bit/sec microwave link, and the others used T-1 or 56K bit/sec leased-line connections.

To ensure reliable network service, NEARNET has deployed the same routers, router software and modems throughout the network, all of which it owns.

The equipment is placed on member sites but is not integral to members' internal networks. This enables NEARNET to exercise better control over the network than if individual members owned and operated the equipment.

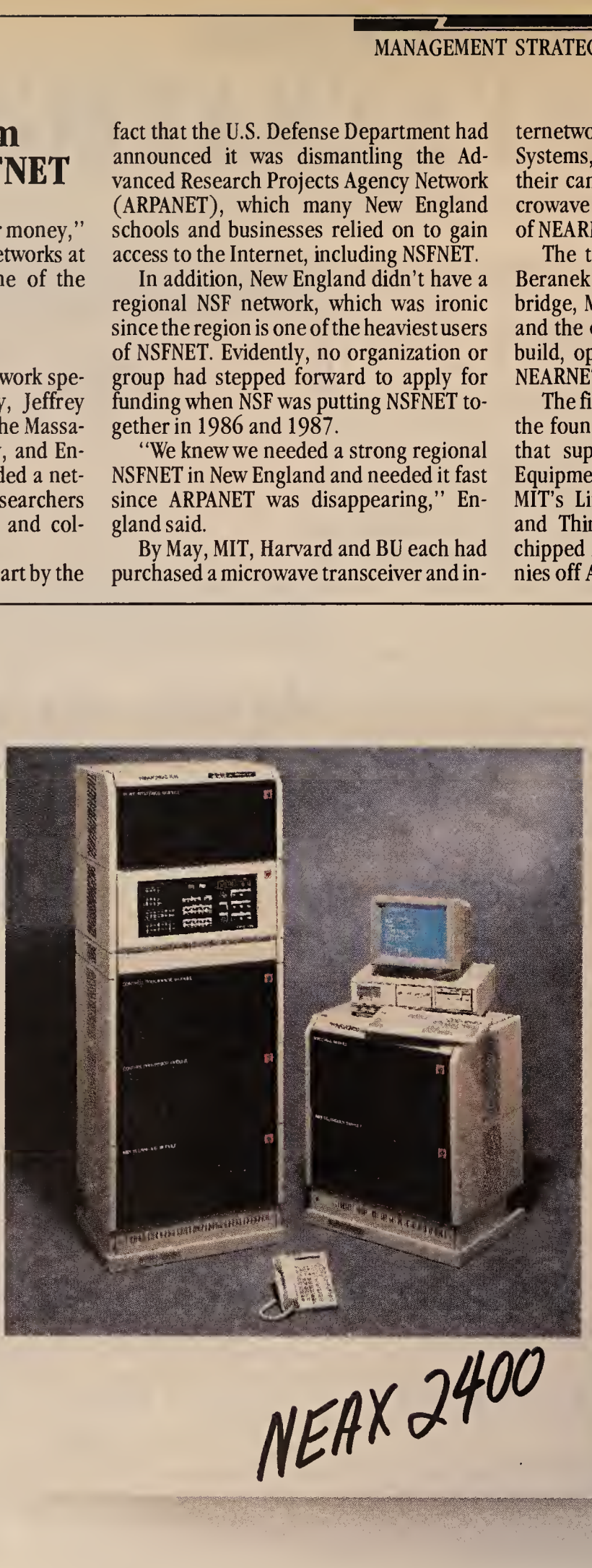
NEARNET, for example, can easily upgrade router software without worrying about how it will affect user networks. In addition, because NEARNET stocks extra network components, it guarantees that it can fix network problems or replace faulty equipment at user sites in four hours or less.

Looking to the future

In little more than a year, 10 schools and 36 businesses have joined NEARNET, and NEARNET officials expect total membership to jump to 75 by 1992.

Much of this growth is expected to come from organizations that historically have not participated in Internet but may benefit from communicating with other scientific and humanities researchers, as well as being able to access supercomputer facilities and data bases on the Internet. These include small colleges, large public and university libraries, and even some magnet high schools.

"The fact that NEARNET is growing so quickly shows that many New England organizations believed, as we did, that the region needs a strong NSF network," England said.



Mgmt. style dictates form of global net

continued from page 29

tions or that anticipate expanding their operations globally should form a project team that includes senior executives, line managers, corporate end users and technical networking staff, Palvia said. Smaller companies with no experience in international commerce may want to add an outside consultant to the team, he added.

The project team should then examine the different architectural choices and evaluate each in terms of business goals and management style, Palvia said.

Examples

In the paper, Sankar and Palvia included examples of users employing each of the four architectures.

According to the paper, the Bank of Montreal is an example of a company that has centralized data base management, DP and network management, or Architecture A. The bank's DP facilities in Montreal support regional data centers in five time zones in Canada and, through them, links to other offices around the world.

The Bank of Montreal management pulled DP into a central site to ensure uniformity and to achieve economies of scale, Sankar said. Upper management at the bank reportedly believes that a centralized global strategy will simplify internal management by maintaining a clear hierarchy.

American Express Co.'s Integrated Telecommunications Network, with its network management system centralized in Phoenix and 35 distributed switching nodes in countries around the world, is an example of Architecture B, according to the paper.

The net is based on IBM Systems Network Architecture and supports IBM front-end processors in each node. American Express monitors the network with IBM's NetView network management system from Phoenix. Global systems based on Architecture B work for companies with management that allows some flexibility in individual business units but prefers to establish overall policy from a central site.

Architecture C, where data base management and DP are centralized but some network management functions are distributed, is rare among global companies, Sankar said, but airlines sometimes use this model.

Centralizing DBMS/DP ensures ultimate control of the system, but distributing batch processing network management functions — needed to provide a detailed analysis of the performance of the network and bill different divisions — enable airlines to locate these activities where skilled labor is cheap — in India, for example.

Unless separate business units have distributed processing and data base systems, it does not make sense to distribute network management.

An entirely distributed system, such as the one outlined in Architecture D, can be found in Citibank, N.A.'s Global Telecommunication Network. Citibank's architecture allows the greatest amount of flexibility for its individual business units because it puts a priority on speed and responsiveness, the paper says.

"This architecture is popular among companies that encourage autonomous divisions and loosely control them," according to the paper.

Drills help bank fine-tune plan

continued from page 29

tion, the banks sells disaster recovery services to other companies that want to use the site as a backup facility.

During a simulated or real data center disaster, the staff reroutes traffic over the mesh backbone from the production data center to the backup site. This can be done from a remote personal computer if necessary. Meanwhile, the staff loads a van with magnetic tapes, adding machines, typewriters and other items, and drives to the backup center.

Once there, the staff loads the bank's data base onto the backup mainframe, which takes about 2½ hours, and sets up shop.

The disaster tests are done on Friday nights, and the branch offices run on the backup center all day Saturday, which is a working day for the bank.

"Unless we told [branch managers] we were conducting a disaster test, they wouldn't realize they're running off a different host," Hooper said.

Hooper said he keeps detailed notes of each disaster test and continually refines and updates the recovery procedures.

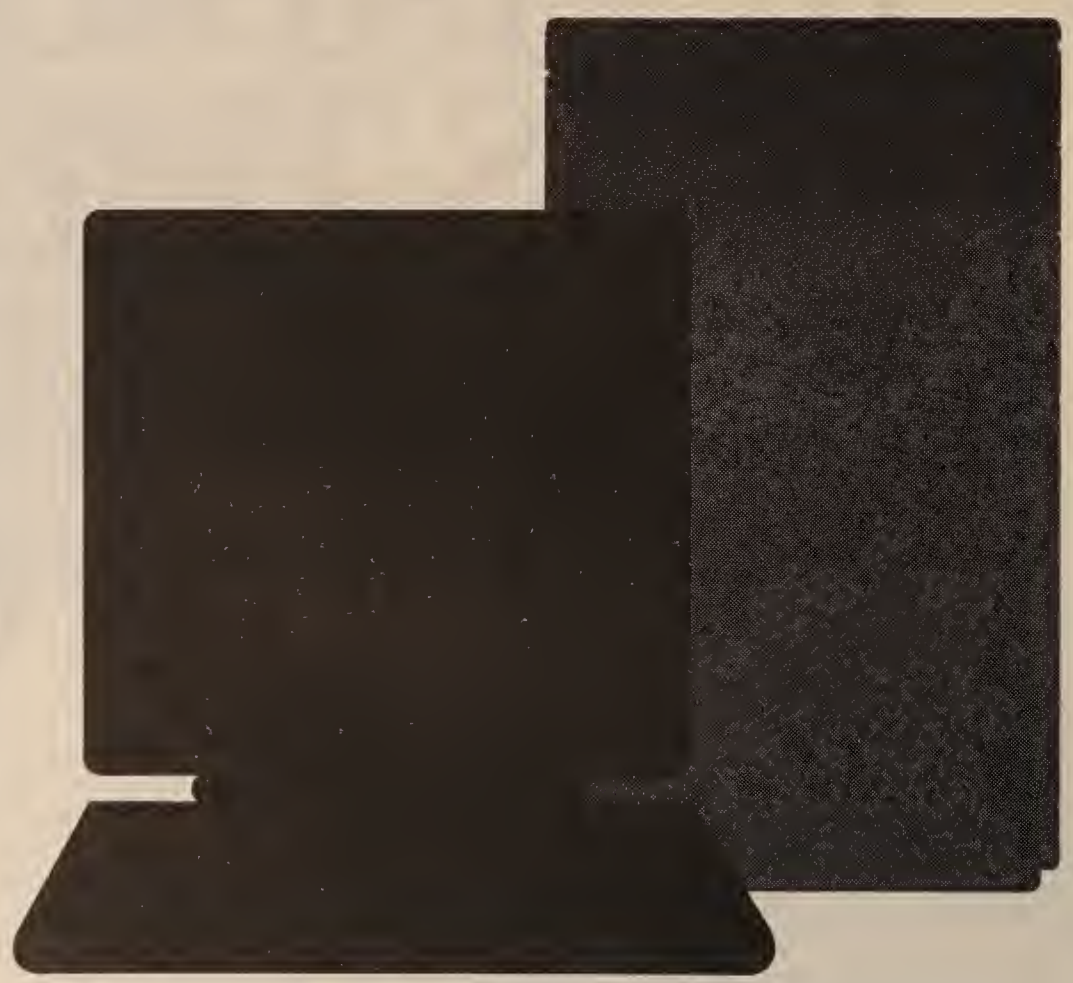
"We thought we had accounted for everything, but during one test, our van broke down, and we were stranded," Hooper said. The bank's disaster recovery plan now contains provisions for an alternate mode of transportation to the backup site in case the van breaks down, he said.

Besides a backup data center, the bank's mesh network provides protection against cable cuts and downed circuits that could disrupt communications to the branch offices. Each office is linked to two other branch offices in a ring topology, which also includes the two data centers.

The multiplexers read the addresses of packets traveling on the network, pull off data packets addressed to their branch and let all others pass around the ring. If a circuit is cut or malfunctioning, the multiplexers automatically reroute traffic back in the other direction.

However, to provide an additional level of backup, each branch office is equipped with a modem that can be used to dial into either one of the data centers if all communications is gone.

SMOKE



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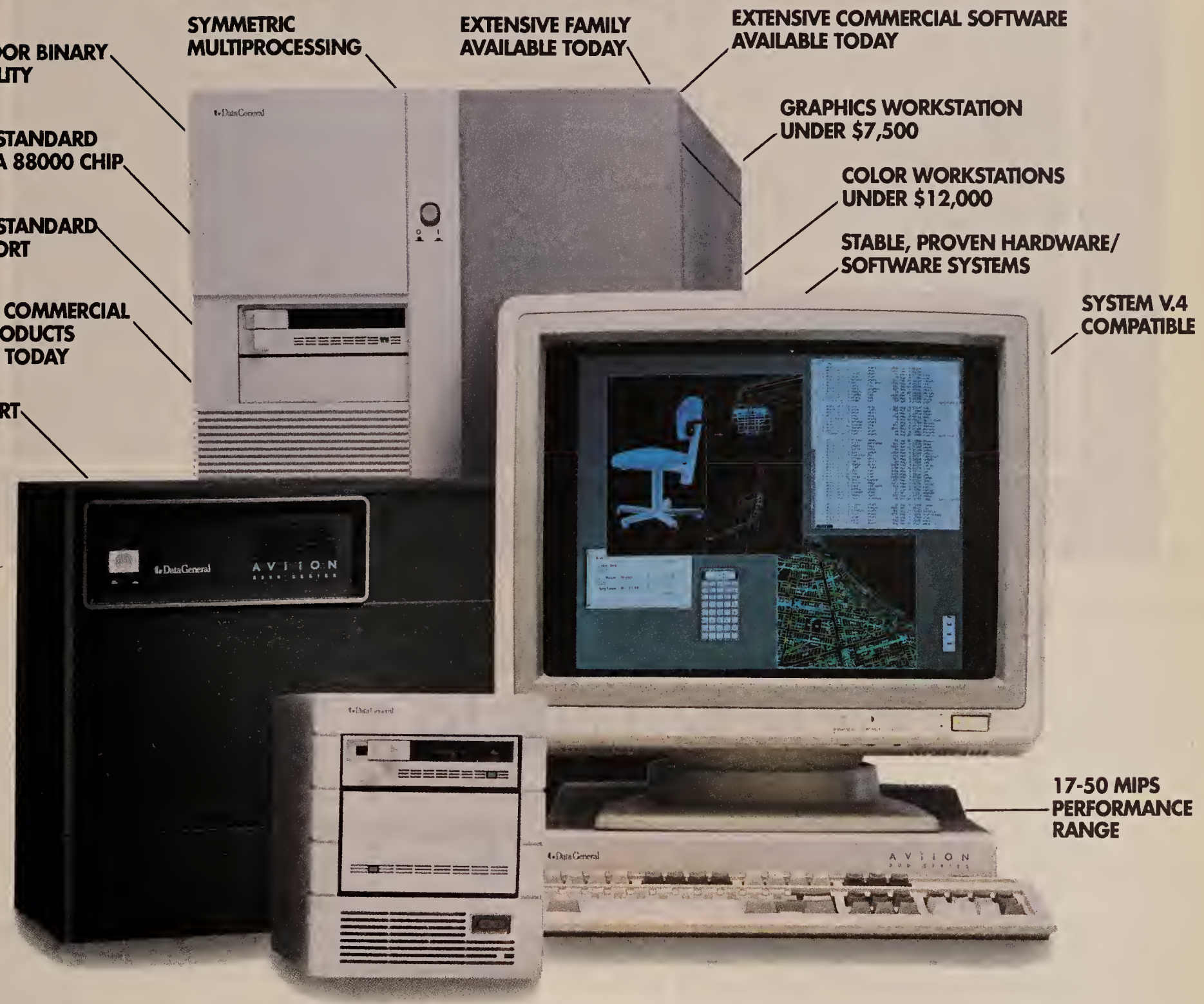

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Worth Noting

US Sprint Communications Co. and Cable & Wireless PLC have teamed up for this summer's rollout of the Global FON calling card, which will let users pay for both international and domestic calls on the carriers' networks.

World News

Orion Network Systems, Inc. recently announced that it has received a $395 million commitment for financing from The Chase Manhattan Bank, N.A. to construct two satellites for a private transatlantic satellite system.

Both satellites will provide data, voice, facsimile, video and teleconferencing services to private sector companies with very small aperture terminal networks.

Orion will provide the services to companies doing business between the U.S. and Europe.

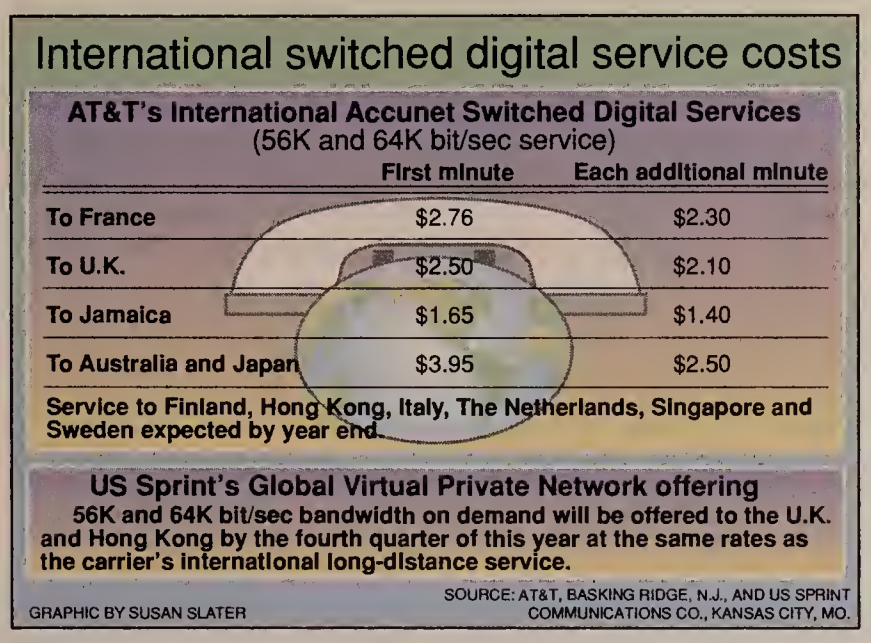
The satellites will also provide services for users conducting pan-European business. The company said the satellites will have the capacity to cover parts of Africa as well.

The first satellite is expected to be launched in mid-1993. The second satellite will be launched in 1994.

The company plans to raise another $500 million through limited partnerships to launch and maintain the satellites.

Nynex Corp. was recently awarded two cable television franchise contracts in the U.K. on the condition that it also provide telecommunications services to businesses and residences in the area.

The franchise award was granted to Nynex and joint venture partner US Cable Corp. The award includes the English communities of Oldham, Tameside, Bury and Rochdale.



Users peeved over access rules for switched services

Int'l carriers force users to lease unwanted lines.

By Barton Crockett
Senior Editor

As users begin gearing up to use international switched digital services, they are voicing concerns about the way they will be required to access these services abroad.

In many countries, users will be forced to subscribe to a local carrier's Integrated Services Digital Network offering or even maintain a T-1 or E-1 link to a carrier's point of presence in order to receive switched 56K or 64K bit/sec service from the U.S.

The need to use T-1 and E-1 links or ISDN equipment abroad will increase the fixed costs associated with international switched digital services and, in the case of ISDN, will force some users to deploy a technology they would rather avoid.

"I am very concerned about how it will affect my networking plans," said Edward Ritscher, vice-president for corporate international data networks at The Chase Manhattan Corp. in New York. "Why should I be forced to comply with ISDN if I don't have a business requirement for it?"

Achin Dasgupta, vice-president in charge of international communications at Shearson Lehman Hutton, Inc. in New York, said his company is interested in using international switched services, "but the dedicated bandwidth thing could be a problem. I'm also in the same camp in that I don't want to use ISDN."

Services bowing

User interest in switched international service is increasing as AT&T expands its existing service and US Sprint Communications Co. moves to deploy its own offering. MCI Communications Corp. has not yet announced plans for international switched digital services.

AT&T's International Accunet Switched Digital Service provides 56K and 64K bit/sec bandwidth on demand to France, Jamaica, Japan and the U.K. Service to Australia will be cut over in a few weeks.

Users can access the switched 56K bit/sec service in the U.S. via switched 56K bit/sec service from local carriers in at least 100 cities or from a dedicated link to an AT&T point of presence at speeds of 56K bit/sec and higher, according to an AT&T spokeswoman.

The switched 64K bit/sec service can only be accessed via an ISDN Primary Rate Interface (PRI) connection to AT&T's network. AT&T charges the same price for 56K and 64K bit/sec transmissions (see graphic).

> "Why should I be forced to comply with ISDN if I don't have a requirement for it?"
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In order to receive the AT&T service in Australia, France, Japan and the U.K., users have to subscribe to ISDN or ISDN-like Basic Rate Interface and PRI services from local carriers. In order to access the service in Jamaica the user needs a dedicated connection to the Jamaica Digiport, an international satellite communications facility.

US Sprint plans to begin offering international switched 56K and 64K bit/sec service later this year to Canada, Hong Kong and the U.K. as part of its Global Virtu-

(continued on page 57)

Int'l firms strive for uniform nets abroad

While some users argue merits of single-vendor strategy for int'l units, others point out hassles.

By Walter Sweet
West Coast Correspondent

Some multinational companies are dictating network equipment and transmission standards to overseas offices in an effort to ensure interoperability with remote sites, facilitate company-wide net management and rein in maintenance costs.

Proponents of the strategy argue that it lets them easily establish compatible links with offices in other countries without waiting for open systems standards to fall into place and products to mature.

Lining up behind a single vendor also expedites maintenance and permits users to monitor and control their enterprisewide networks with a single vendor's net management system.

"Standardizing a net on a single vendor helps the technical staff considerably," said Bob Arends, the national operations manager at Toyota Motor Corp. "It's far easier to configure an international network with one vendor's equipment and one host protocol."

But the strategy is not without its flaws, users contend. Some countries institute protectionist measures that rigorously restrict the types of modems, computers and network equipment that can be imported or used within their boundaries.

For some companies with vast international empires, such as Nissan Motor Corp. and Toyota,

(continued on page 36)

Carriers shuffle IRCs as footholds to int'l markets

By Barton Crockett
Senior Editor

Ever since international record carriers (IRC) lost exclusive rights over international telex and data communications services, they have gone through such a bewildering array of ownership changes that to some it looks like the companies have disappeared.

But IRCs are emerging as the foundation for some U.S. long-haul service providers, including MCI Communications Corp., to offer international carrier services to Europe and other areas abroad. These companies are providing their new parents with a strong international presence.

None of the five major IRCs — French Telegraph Cable Co., ITT World Communications, Inc., RCA Global Communications, Inc., Tropical Radio Telegraph Co. and Western Union International — is now owned by its original parent company.

Western Union International, which was divested from Western Union Corp. in the 1960s, is now owned by MCI. MCI also owns RCA Global Communications, which it acquired from General Electric Co.

Tropical Radio Telegraph and French Telegraph Cable have been merged to form TRT/FTC Communications, Inc., a unit of Portland, Ore.-based PacifiCorp. Western Union now owns the international packet-switching and telex units of ITT World Communications, while a Baden, Switzerland-based power utility, Motor Columbus AG, owns ITT World Communications' private-line facilities.

Up until 1982, the IRCs were the only companies licensed by the Federal Communications Commission to provide international telex, packet-switching and private-line data communications services. Until that year, the FCC operated a dual set of regulations, which kept international voice carriers such as AT&T out of the international data communications business.

In 1982, however, the FCC allowed any carrier to provide international services, as long as the country on the other end of the link agreed. As a result, competition heated up and carriers such as AT&T entered IRC markets. At about the same time, demand for telex services, which comprised the bulk of IRC revenues, began to lag.

Consequently, IRCs have been bought and sold dozens of times by companies looking to enter a relatively virgin market.

"People think AT&T's got an advantage internationally, but we've actually been providing service longer than they have," an MCI spokesman said.

Int'l firms strive for uniform nets

continued from page 35

standardizing their networks internationally has been relatively painless because they did not encounter any problems installing an international network.

But other users with smaller international presence, such as The Boeing Co., have made little effort to standardize their sites abroad. Boeing intentionally leaves installation, maintenance and management concerns up to the individual offices. It just asks that remote offices communicate with the electronic mail system used in the home office.

According to Cory Van Wolvelaere, a partner in telecommunications consulting with Andersen Consulting, a unit of Arthur Andersen & Co. of Chicago, few companies are capable of or committed to instituting network standards in offices abroad.

"The corporation that tries to standardize down to the personal computer has failed," Van Wolvelaere said. "To have MIS control the acquisition of a PC on somebody's desktop is an exercise in futility."

Van Wolvelaere said problems associated with trying to standardize networks include the unavailablity of products in some countries and tight restrictions that might prohibit importing certain technologies.

For companies that have standardized international operations, keeping a handle on net management and maintenance are the most important factors.

"Overall compatability means ease of use, ease of diagnosis and ease of technical support," said Lee Roberts, technical support manager for communications at Nissan. "With the same expertise on both ends [in Japan and in California], it makes it a lot easier to diagnose and operate."

The Bank of Hawaii, which operates 60 branch offices, including five in outlying Pacific islands, created a uniform network that serves each of its offices abroad, with the exception of a branch in Tokyo. That office cannot be brought on-line with headquarters due to Japanese banking regulations.

The bank operates a terminal-based network running on an NCR Corp. Tower host. Remote terminals are linked via leased lines to the Tower host.

"Without a standardized system, maintenance is such a problem when you have so many flavors out there," said Wayne Nakamoto, technical support manager for the bank.

> "The corporation that tries to standardize down to the personal computer has failed."
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For Toyota, maintenance is a primary reason for standardizing its networks, Arends said. The company uses strictly IBM computers, from 3090 Model 400 mainframes to Personal System/2 microcomputers.

Toyota's Torrance, Calif., office ties all those devices together over IBM Token-Ring Networks in North America. The Torrance office serves as a hub for exchanging information between the car maker's nine North American regions and Japan. Toyota uses only Fujitsu America, Inc. T-1 multiplexers in Torrance, Georgetown, Ky., and Japan to switch data across the network.

Voice, fax and data are routed from U.S. sites to Torrance on the company's standardized network, Toyonet, a worldwide Systems Network Architecture backbone network. It is then sent to Japan on a transpacific fiber-optic cable. Information also comes from Japan and is sent out to the U.S. offices on Toyonet.

Toyota likes the arrangement of only having to make one call — either to IBM for computers or to Fujitsu for multiplexers — to report any number of problems, rather than dealing with several vendors. "Multiple vendors only present problems when it comes to fixing problems," Arends said.

Like Toyota's Torrance site, Nissan's Gardena, Calif., office serves as a network hub between all North American offices and

(continued on page 62)

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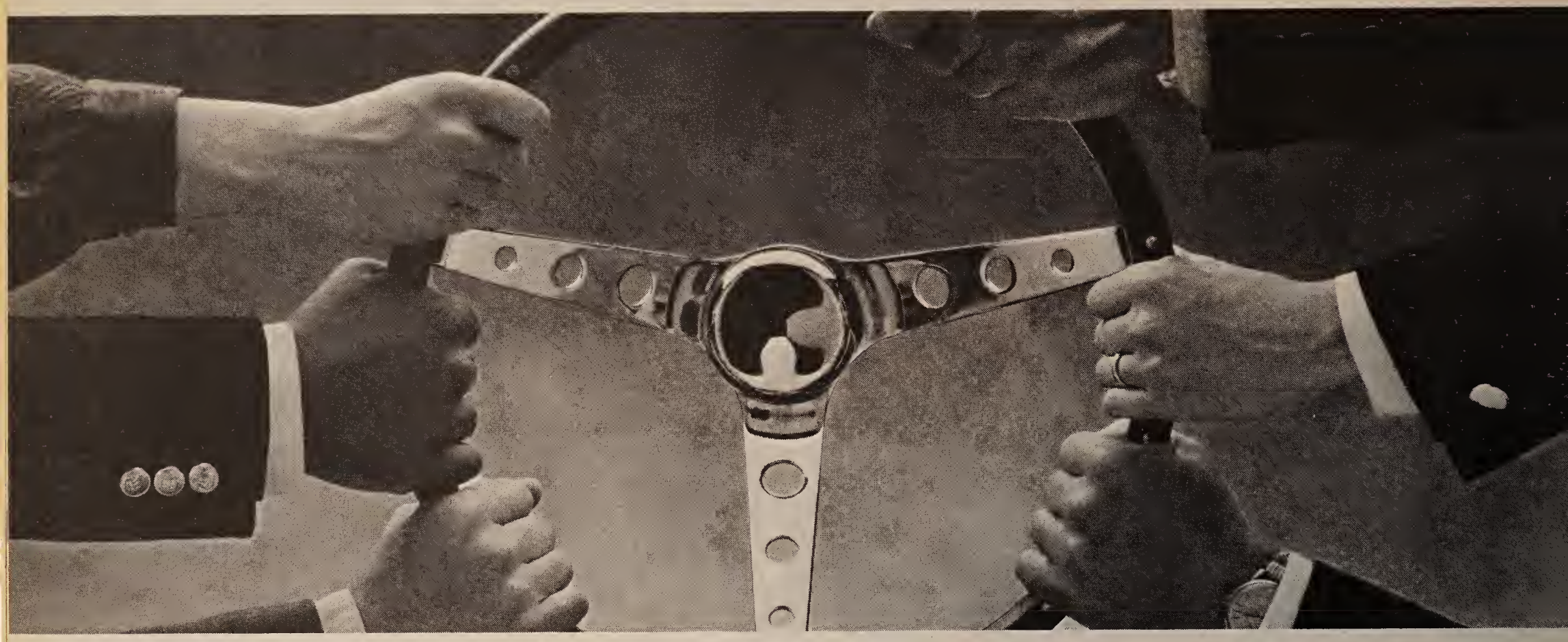

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PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

First Look

Wang unveils ISA bus PC that works as LAN server

Wang Laboratories, Inc. recently introduced an Intel Corp. 80386-based personal computer with an Industry Standard Architecture (ISA) bus that is being positioned as a local-area network server.

The new 33-MHz **PC 380/33C** can run DOS, OS/2, Unix or The Santa Cruz Operation, Inc.'s Xenix. In addition, it is independent of network operating systems and can be used in Ethernet or token-ring LANs. Wang said the personal computer is the fastest and most powerful member of its 80386 product line, replacing the previous high-end machine, the PC 380/25C.

The system has eight 16-bit ISA slots for memory expansion, LAN interface cards, modems, graphics adapters or microcomputer-to-mainframe cards. The CPU board supports 1M or 4M bytes of random-access memory. The system offers standard hard-disk storage options of 20M bytes, 40M bytes, 100M bytes and 200M bytes.

The PC 380/33C offers 64K bytes of cache memory, which helps keep the CPU running at maximum speed by ensuring that frequently used data resides in cache memory when the CPU requests it.

A system configured with 1M byte of RAM and a 1.2M-byte or 1.44M-byte floppy drive costs $5,995. A system with 4M bytes of RAM and a 1.2M- or 1.44M-byte floppy disk drive costs $6,745.

The product is expected to begin shipping in June.

Wang Laboratories, Inc., 1 Industrial Ave., Lowell, Mass. 01851; (508) 459-5000.

Vehicle tracking system rolls out across U.S.

Motorola, Inc. recently announced that its **Coverage-PLUS** long-haul vehicle communications and tracking system has gone on-line in the Chicago-Detroit-Cincinnati "auto alley" and is expected to be rolled out along major U.S. interstates by year end.

The mobile radio system supports two-way data and voice communications be-

(continued on page 41)

Bridge supports Spanning Tree and source routing

CrossComm unit can handle both types of data.

By Tom Smith
New Products Editor

MARLBOROUGH, Mass. — CrossComm Corp. recently introduced a local token-ring bridge that is able to communicate with bridges supporting either the Spanning Tree Protocol or source routing protocol.

CrossComm's High Speed Bridge Token Ring-to-Token Ring (HSB-RR) can transmit to and receive data from bridges that support either protocol. It can also convert from Spanning Tree to source routing so that a non-IBM local-area network can communicate with an IBM LAN.

In addition, HSB-RR supports source routing transparent (SRT), an IBM-proposed IEEE standard that merges Spanning Tree and source routing.

HSB-RR connects a single 4M or 16M bit/sec token-ring LAN to a token-ring backbone.

HSB-RR is the second product in CrossComm's HSB line. The company previously announced HSB Ethernet-to-Ethernet, a local Ethernet bridge ("Bridge sustains 10M Ethernet throughput," *NW,* Sept. 18, 1989).

Prior to the introduction of CrossComm's new bridge, users were plagued by incompatibilities between bridges supporting either source routing or the Spanning Tree Protocol. For example, source routing users could not send packets to a Spanning Tree bridge because that bridge would not recognize and forward the packets.

Spanning Tree, which is protocol-independent, performs automatic learning and routing. It ensures a loop-free topology in a large network, despite the fact that redundant links may exist.

Source routing, on the other hand, is protocol-dependent and, unlike Spanning Tree, requires LAN nodes to run software that defines network routes. Operating systems such as IBM's PC LAN Program and OS/2 Extended Edition 1.1 are designed to work only with source routing bridges.

Despite these incompatibilities, CrossComm's product enables the two bridges to communicate.

In HSB-RR's dynamic conversion mode, the bridge automati-

(continued on page 57)

ODS Ethernet wiring hubs support 10BaseT, SNMP

By Laura DiDio
Senior Editor

RICHARDSON, Texas — Optical Data Systems, Inc. (ODS) recently introduced a line of intelligent Ethernet wiring concentrators that support the emerging 10BaseT wiring standard, as well as the Simple Network Management Protocol (SNMP).

The 290 family of Ethernet concentrators consists of two models, each of which can be configured as the central controller in a star-wired topology. The 12-slot 290 model can support as many as 96 users on multiple Ethernets, while the five-slot 291 model can support as many as 48 users on two Ethernets.

Besides supporting 10BaseT-compliant unshielded twisted-pair wiring, the new ODS concentrators support fiber-optic cabling, and thick- and thin-wire Ethernet cabling, according to Joe Head, the company's senior vice-president.

The 290 model features eight adapter slots that house 12-port Ethernet cards to link user workstations to the wiring hub. It also has four slots that are reserved for wide-area net interfaces and network management adapters, Head said. The eight workstation interface slots can be configured with any combination of Ethernet media adapters for 10BaseT, fiber-optic or traditional thin- and thick-wire cabling.

The remaining card slots are reserved for the SNMP adapter and internetwork local-area network interfaces such as bridges, routers and gateways, and a 100M bit/sec Fiber Distributed Data Interface adapter. The adapters will ship this fall, with the exception of the FDDI interface, which will be delivered next spring.

The 291 model is a five-slot device that supports all of the adapters available for the larger 290 concentrator. The 291 Ethernet concentrator has three workstation adapter slots and two slots dedicated to WAN and net management adapters.

Head noted that ODS' 290 and 291 Ethernet concentrators also offer users a "collision-avert"

(continued on page 40)

AT&T Paradyne's new DSU/CSUs

	Comsphere 3600 data service unit	Comsphere 3500 data service unit
Digital services supported	-AT&T Dataphone Digital Service -AT&T Accunet Spectrum of Digital Services	-AT&T Dataphone Digital Service -AT&T Accunet Spectrum of Digital Services
Data terminal equipment interfaces	-V.35 -RS-232	-V.35 -RS-232
Management options	-Paradyne 6510 Network Management System -AT&T Dataphone II Level IV -Comsphere 6800 -IBM's NetView	None
Hardware/ software options	-Multiplexing on point-to-point and multidrop lines -Dial backup -Diagnostic interface to NetView	None
Price	-Stand-alone model: $1,550 -Rack-mount model: $1,475	-Stand-alone model: $750 -Rack-mount model: $675

GRAPHIC BY SUSAN SLATER — SOURCE: AT&T PARADYNE, LARGO, FLA.

New DSU/CSU offers multiplexing option

AT&T Paradyne's Comsphere 3600 multiplexes traffic from several devices over one digital line.

By Tom Smith
New Products Editor

LARGO, Fla. — AT&T Paradyne last week announced the Comsphere 3600 Series DSU, a data service unit/channel service unit (DSU/CSU) with options that allow it to multiplex traffic from several devices over a single point-to-point or multidrop line.

The company also introduced the low-end 3500 Series DSU, the 3000 Series Carrier for rack-mounted versions of both DSU/CSUs and the 5312 T-1 multiplexer, which can support T-1 and fractional T-1 lines.

The Comsphere 3600 and the Comsphere 3500 Series are the first DSU/CSU additions to the company's existing Comsphere product line.

Comsphere previously consisted of a rack-mountable modem supporting speeds ranging from 2,400 to 19.2K bit/sec and the Comsphere 6800 Network Management System, which is based on an AT&T 3B2 minicomputer running Unix ("Paradyne product blitz focuses on modems," *NW,* Jan. 29).

The addition of a DSU with multiplexing capabilities allows users to transmit data — supporting a variety of protocols and generated under a variety of applications — over a single digital line.

AT&T Paradyne's new Comsphere 3600 provides RS-232 and V.35 interfaces for linking a single data terminal equipment (DTE) device to digital services including AT&T's Dataphone Digital Service and Accunet Spectrum of Digital Services. Speeds supported range from 2,400 to 64K bit/sec.

The Comsphere 3600 is available with several options.

An IBM Systems Network Architecture Diagnostic Interface, a software option, allows the 3600 to be managed bidirectionally by NetView. The SNA interface, which performs IBM 5822 DSU emulation, supports NetView's Link Problem Determination Application-2 diagnostic protocol.

Each Comsphere 3600 can also be managed by Paradyne's 6510 Network Management System, which runs on a Motorola, Inc. 68010-based microcomputer; AT&T's Dataphone II Level IV, based on the AT&T 3B2 minicomputer; or the Comsphere 6800. AT&T and Paradyne merged in March 1989.

The Multi-Channel Multi-Point hardware option for the Comsphere 3600 resides in the 3000 Series and performs time-division multiplexing, allowing traffic from as many as six DTE devices running different protocols and applications to be consolidated for transmission over one multidrop digital link.

Another hardware option, Time Division Multiplexer/Digital Sharing Device, offers the same functionality as the multichannel option, but it can only support point-to-point, rather than multidrop, lines.

Other hardware options include Dial Restoral, which supports dial-up point-to-point and multidrop lines at speeds ranging from 2,400 to 12K bit/sec.

The Comsphere 3600 is ex-

(continued on page 40)

New DSU/CSU offers multiplexing option

continued from page 39

pected to be available in July in two models: the 3610 Standalone Model, which is intended for remote offices, and the 3611 High Density Carrier Card for the 3000 chassis. Their prices are $1,550 and $1,475, respectively.

Bundled with the Dial Restoral hardware option, which will be available in July, the 3610 and 3611 cost $2,495 and $2,425, respectively. The other options will be available in the fourth quarter, but pricing has not yet been set.

The new 3500 DSU supports the same DTE interfaces and line speeds as the Comsphere 3600, as well as the same digital services. It does not, however, provide the management or hardware options that are available on the Comsphere 3600.

AT&T Paradyne's 3500 DSU is also available in stand-alone and rack-mountable versions. Users can mix Comsphere 3600 and 3500 DSUs in the 3000 chassis. The 3510 Standalone Model costs $750, while the 3511 High Density Carrier Card costs $675. Both will be available in July.

The new 3000 chassis has the same number of slots as the existing Comsphere 4000 Intelligent Communications Carrier. The 4000, however, supports only network-managed modem interfaces and is designed for more complex networks.

The 3000 Series chassis is available now and costs $1,200.

The vendor also rolled out the 5312 T-1 Multiplexer, which can support a T-1 or fractional T-1 line. By contrast, the company's high-end Acculink multiplexers can support up to 16 T-1 lines and can be managed by the Comsphere 6800. The 5312 has 12 slots for a variety of voice and data interfaces, which can aggregate a maximum of 60 channels over the total bandwidth supported by the multiplexer.

The 5312 T-1 Multiplexer is expected to be available in July. A unit with a T-1 interface and two data interfaces supporting speeds up to 64K bit/sec costs $6,000. A high-end configuration with 12 interfaces costs about $14,000.

AT&T Paradyne can be reached by writing to 8545 126th Ave. N., P.O. Box 2826, Largo, Fla. 34649-2826, or by calling (800) 482-3333.

AT&T Paradyne's 5312 T-1 mux local interfaces

- Two-port pulse code modulation voice
- Four-port PCM voice
- Two-port adaptive differential PCM voice
- One-port high-speed data (48K bit/sec to T-1)
- Five-port subrate data multiplexing (total bandwidth of 64K bit/sec)
- Two-port low-speed synchronous data (1,200 to 19.2K bit/sec)
- Two-port low-speed asynchronous data (50 to 38.4K bit/sec)

SOURCE: AT&T PARADYNE, LARGO, FLA.
GRAPHIC BY SUSAN SLATER

ODS Ethernet wiring hubs support SNMP

continued from page 39

feature built into all of ODS' adapters.

Most current Ethernet adapters only offer collision detection, which notifies workstations when a collision has occurred.

"Collision detection does nothing to prevent the data collision; it only tells you that it's occurred, and by that time, both of the collided packets have been trashed or lost. This means the data has to be retransmitted," Head said.

By contrast, each of ODS' 12-port Ethernet cards is equipped with the two-way collision-avert switch, which enables the network administrator to avoid collisions and loss of data when two Ethernet packets are transmitted simultaneously.

The collision-avert feature allows the first data packet to be transmitted without collision, but it intentionally sends a collision signal to other Ethernet stations attempting to transmit at the same time. This forces the other stations to retransmit their packets.

Joseph del Chiuski, a network manager at the University of British Columbia in Vancouver who has beta-tested the product, said that the collision-avert feature will enable him to significantly increase the packet throughput and reliability of Ethernet transmissions on his network.

"The collision-avert feature lets us transmit double the number of packets across our network. [Many of these packets] would have otherwise been lost to data collisions," del Chiuski said.

The ODS 290 and 291 Ethernet concentrators also support optional SNMP net management software, which resides in both the wiring concentrator and the network administrator's workstation. The SNMP software provides network administrators with detailed analyses of network data traffic. This gives the network administrator data such as the packet size and description, source and destination address. Additionally, the SNMP interface monitors data errors, as well as collisions and their sources.

The 290 and 291 Ethernet concentrators are available now. Pricing starts at $4,000 for the 290 with one Ethernet interface; additional interfaces cost $2,900. The 10BaseT card is priced at $1,995, and the SNMP adapter costs $2,200. Pricing for the 291 Ethernet interface starts at $3,695.

For more information, contact Optical Data Systems at 1101 E. Arapaho, Richardson, Texas 75081, or call (214) 234-6400.

Hitachi America high-end PBX handles 1,000 trunks, 6,000 lines

Company also intros voice mail and voice processing system.

By Tom Smith
New Products Editor

NEW ORLEANS — Hitachi America, Ltd. last week unveiled a high-end model for its HCX5000 line of private branch exchanges that supports as many as 1,000 trunks and 6,000 lines.

At the International Communications Association's 43rd Annual Conference and Exposition here, the company's Telecommunications Division rolled out the new HCX5600, which supports twice as many lines as the HCX5000's existing high-end switch, the HCX5500. The addition complements the other HCX5000 models: the HCX5400, which supports up to 1,500 lines, and the HCX5300, which supports as many as 416 lines.

Hitachi also announced its first voice mail and voice processing system, which is designed for the HCX5300 and HCX5400.

The HCX5600, which supports both analog and digital central office trunks, has a modular architecture that allows users to expand from 1,500 lines to 6,000 lines. A high-end line configuration would use 32 hardware modules, each with 20 universal slots.

The switch's universal slots can house 16-line analog or digital interfaces to telephones. They can also be populated with interfaces to trunk lines from a central office switch. The central office interfaces available support eight analog lines, a single T-1 or an Integrated Services Digital Network Primary Rate Interface (PRI) line. PRI divides the capacity of a T-1 line into 23 64K bit/sec voice or data channels and a single 64K bit/sec signaling channel.

Like all other members of the HCX5000 line, the HCX5600 has a built-in automatic call distributor (ACD). The HCX5600's ACD software can support a maximum of 48 groups of agents with as many as 258 agents in a single group.

Hitachi's latest generation of software, COMMerce Release 6.0, which was introduced in January, offers networking features that allow the HCX5600 to be linked to other HCX5000 switches or to other vendors' PBXs.

PBX applications such as voice mail, ACDs and internal numbering plans can be extended to other HCX5000s in remote sites using COMMerce's Features Transparency Networking (FTN). Hitachi uses a proprietary out-of-band signaling protocol for FTN that is similar to ISDN's Signaling System 7.

COMMerce software also supports data communications within and between sites using data adapters on the company's SelecSet digital telephones. Those adapters currently support data at speeds up to 19.2K bit/sec but will be upgraded by year end to support speeds up to 64K bit/sec.

HCX5600 will be available in June for $450 per end-user station, a cost that includes system software, interface cards and Hitachi's SelecSet phones.

Voice-messaging system

The company also announced the COMMplement Voice Messaging System (VMS), a hardware device with RS-232 connections to the HCX5300 and HCX5400.

The basic COMMplement VMS unit has two RS-232 ports, but it can be expanded, in increments of two, to as many as eight ports. A two-port unit provides 2½ hours of storage, while an eight-port unit provides six hours of storage. The system can support as many as 500 voice mailboxes.

COMMplement VMS is available now. End-user pricing for two ports and 2½ hours of storage starts at $12,000. A unit with eight ports and six hours of storage costs more than $30,000, the company said.

The Telecommunications Division of Hitachi can be reached in writing at 2990 Gateway Drive, Norcross, Ga. 30071, or call (404) 446-8820.

First Look

continued from page 39

tween trucking company headquarters and drivers on the road. It saves truckers time by eliminating the need to stop and phone headquarters. It also enables trucking companies to provide their customers with more accurate data on shipment status.

In a related move, BT Tymnet, Inc. announced that Motorola has contracted to use the Tymnet public packet network to link radio base stations to the Motorola radio hub and to provide access for data communications from users' dispatch centers to the CoveragePLUS system.

That will give users more flexibility in accessing the system than satellite-based nets, which typically offer only one or two access points to their systems. Also, satellite systems do not support voice.

Vehicle hardware for CoveragePLUS costs between $1,955 and $3,695, depending on the features selected. The monthly usage fee is $35 per vehicle, 5 cents for each 240-character text message and airtime, plus long-distance charges for voice communications.

Motorola, Inc., 1301 E. Algonquin Road, Schaumburg, Ill. 50198; (708) 576-6612.

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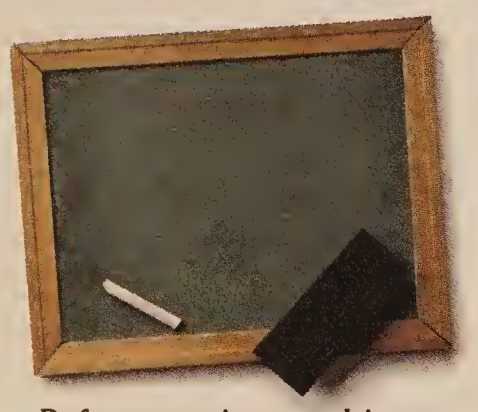

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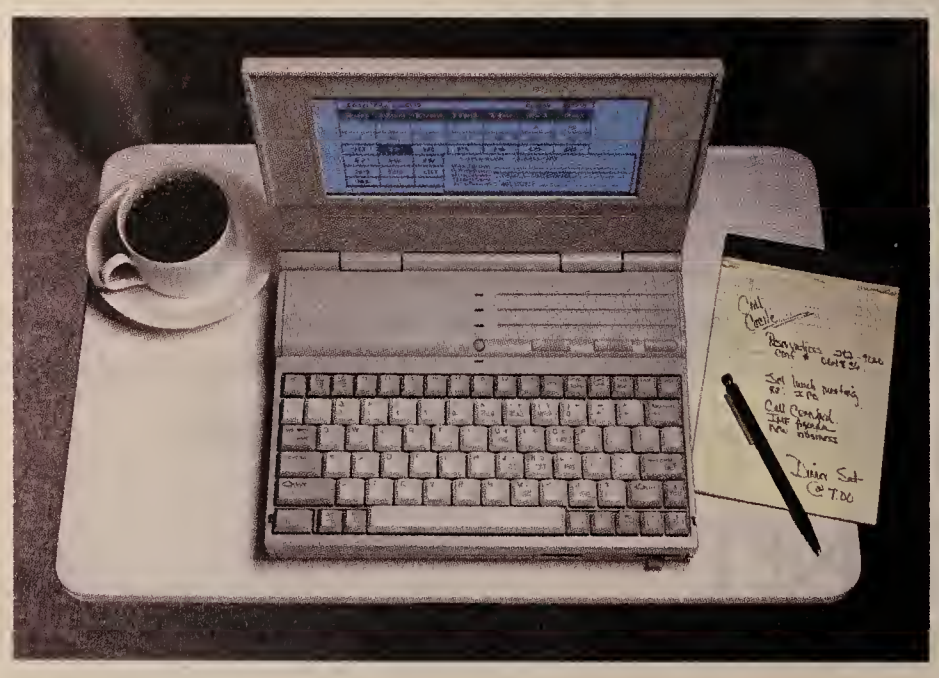

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OPINIONS

SWITCHED DATA SERVICES

BY DAVID SABO

Technology lags in Pacific Bell's California

In the great state of California, with its high-tech industries and money, users should be able to implement telecommunications technologies that are, if not at the cutting edge, at least on par with other areas of the country. And sifting through the tariffed options from Pacific Bell, the dominant carrier in California, seems to demonstrate that users can. The real world, however, is another story — particularly in the case of switched 56K or 64K bit/sec data service.

Pacific Bell, in fact, tariffed switched 56K bit/sec service a couple of years ago. I've been attempting to order it ever since it was tariffed. Over these two years, I have received a number of excuses for why it's not available: "We have a clocking problem," "Our technicians aren't trained," and "We're introducing another service that will supersede switched 56."

> Pacific Bell seems to be floundering as far as developing a cohesive direction is concerned.
>
> ▲▲▲

Well, I was pretty pumped up when I got the news, just before Christmas last year, that Pacific Bell was introducing CenPath, a switched 56K/64K bit/sec data service for Centrex users. Used in conjunction with its tariff for two-line Centrex and costing about $40 per line per month for switched 56K/64K access, CenPath conjured up all sorts of possibilities. In my case, it offered Group IV facsimile that was cost-justifiable. I figured — incorrectly — that cost-effective, on-demand, high-speed data services had arrived in California.

Because CenPath is Pacific Bell's implementation of Northern Telecom, Inc.'s Data Path, to obtain CenPath service, a user's central office must have a Northern Telecom DMS switch implemented. In fact, both the transmitting and receiving ends of the line must have a DMS in the central office. However, California's Local Access and Transport Area 5, which encompasses Los Angeles, contains 1,665 exchanges; Pacific Bell owns just 1,122 of them. Furthermore, only 176 of these 1,122 exchanges are implemented on DMS switches.

So is Pacific Bell's CenPath offering a building block to an all-encompassing future offering? Based on my past experience, the answer is no. For one thing, Pacific Bell seems to be floundering as far as developing a cohesive direction for switched digital services is concerned. I've heard the Integrated Services Digital Network argument. Let's get real, though. It's not here, and it won't be here for a couple of years, at least.

I don't know exactly why Pacific Bell can't get its switched digital services act together, but here are some educated guesses. Could a cumbersome bureaucracy be part of the reason? Lack of cohesive management? Still being dependent on AT&T? Or could it be they don't have the technical talent to implement technology? An inability to market and sell is a definite factor.

It would be simple, but unfair, to place all of the blame on Pacific Bell for its product shortcomings. It must be kept in mind that Pacific Bell is a regulated utility, which presents a number of problems not inherent to private industry. Yet, it would seem that if a carrier was prepared to go through the regulatory process of obtaining a tariff, as was the case for switched 56K bit/sec service, it would certainly be able to deliver the product. In the case of CenPath, it seems rather ridiculous to give a hardware-specific option a product name, thus implying that it is a global offering.

Sabo is a Group IV marketing specialist in the facsimile division of Astro Office Products, Inc., a Canon U.S.A. subsidiary located in Gardena, Calif.

EDITORIAL

Sikes must consider users' concerns about price cap plan

"Too often in the past, those who are dependent on public networks have been worried that the FCC would only give lip service to their concerns. Let me reassure you and reiterate that this FCC has gone — and will continue to go — beyond lip service."

— Alfred Sikes

In his remarks at the International Communications Association's 43rd Annual Conference and Exposition last week, Federal Communications Commission Chairman Alfred Sikes emphasized that the FCC is committed to seeking out and responding to the concerns of users in its policy-setting procedures.

To date, Sikes has made good on that commitment. Until recently, users and vendors alike praised Sikes for giving all parties the chance to air their views on an issue.

Now, Sikes faces a real test in the issue of price caps for local exchange carriers. It's a test that will show just how effectively Sikes can balance his beliefs with the needs of those whom the FCC was set up to protect.

It's no mystery that Sikes is a proponent of abandoning rate-of-return regulation. In an interview with *Network World* last week, Sikes reiterated his belief that rate-of-return should be abandoned in favor of incentive-based regulation, which Sikes insists is not a step toward deregulation.

But when it comes to price caps for local exchange carriers, users are clearly worried. This concern was evident earlier this month when a coalition of major corporations, users groups, long-distance carriers and state regulators gathered to voice concern about the FCC's current price cap plan — which group members contend will lead to higher prices and deterioration of the public network.

More worrisome than the group's specific concerns is the fact that some members contend that the FCC is moving ahead with price caps despite user protests. In short, some seem to feel that the FCC is painting the picture of a price caps consensus that doesn't exist.

We urge the FCC to move cautiously with the price cap plan. Clearly, there is dramatic disagreement over the potential impact of the plan on customers.

Perhaps Sikes ought to call a meeting of users, carriers and regulators to discuss critical issues and redraft the price caps plan, if needed. The summit meeting approach has already worked for Sikes, who recently called together state and federal regulatory officials to try to improve relations between them.

Sikes must be careful not to dilute the good will he's worked so hard to foster. That good will goes a long way toward building the consensus needed to set policy.

OPINIONS

REGULATORY ISSUES

BY ALAN PEARCE

Appeals Court ruling has far-reaching implications

U.S. District Court Judge Harold Greene may be on the verge of losing control over the business destinies of the regional Bell holding companies. Critics of Greene claim he holds too much power over the future of the economically pivotal telecommunications and information industry.

But in April, a Washington, D.C. Circuit Court of Appeals took a major step toward limiting that power when it rendered a decision that could force Greene to permit the RBHCs to offer information services. The court also laid out a detailed road map that should lead to significant business relief for the RBHCs in the not-too-distant future.

The Appeals Court "reversed and remanded" Greene's 1987 ruling on information services, instructing him to review his previous opinion. The ruling also limits Greene's review of the information services restriction on the RBHCs, contained in the Modified Final Judgment, to antitrust considerations only. In the past, Greene has considered other factors, such as the effect on ratepayers and whether new RBHC business ventures are wise investments.

Although the court upheld the restrictions on equipment manufacturing and long-haul services, Greene's next triennial review of these restrictions must also be confined to antitrust analysis, weighing only the effects on competition. The Appeals Court's decision even seems to suggest that Greene should permit the RBHCs to offer at least long-haul cellular telephone services and perhaps even specialized private-line long-distance services.

The court also ruled that the Department of Justice and Greene erred in not separating customer premises equipment from central office and transmission equipment. The Appeals Court seemed to suggest that the RBHCs should be allowed to manufacture customer premises equipment only.

Almost everyone agrees that the Appeals Court's decision is good for the RBHCs and bad for their competitors. But the major question left unanswered is, what happens next?

A group of companies, led by MCI Communications Corp. and, somewhat surprisingly, excluding AT&T, have gone to the Appeals Court seeking a stay of the remand while they appeal the case to the U.S. Supreme Court. The Supreme Court may well take the case, largely because several justices, including Justice Antonin Scalia, have an interest in the telecommunications and information industry. But the Supreme Court will not rule on whether it will take the case until the early fall.

Meanwhile, it is thought to be extremely unlikely that the Appeals Court will issue the stay that MCI and the rest of the group have requested. Consequently, Greene will have to hold new hearings, probably some time this fall, based on the Appeals Court's remand. Greene may then reaffirm his original decision based on the narrower grounds imposed by the court.

A somewhat more radical option, however, given the growing ground swell for changing the Modified Final Judgment, is that Greene could dump the information services and manufacturing prohibitions. If he does this or decides to amend the Modified Final Judgment in any way, Greene could recommend that the Federal Communications Commission strictly regulate the RBHCs' business activities.

The Justice Department is preparing its second triennial review of the Modified Final Judgment. Because of the Appeals Court decision and because of pressure from Capitol Hill, it is likely that the Justice Department will make major recommendations for relaxation of the line-of-business restrictions imposed on the RBHCs.

If the RBHCs' position continues to gain strength in the courts, then there will be no need for them to press Capitol Hill for legislative relief. Under this scenario, the Modified Final Judgment will collapse in the next two to four years and the FCC will take over as the primary federal regulator of the telecommunications and information industry.

There is good news and bad news in all of this for the RBHCs. The good news is that the Modified Final Judgment is about to fade away and new business opportunities are emerging. The bad news is that the FCC is becoming a tougher regulator at a time when competition is increasing at the local loop — long regarded as a local telephone company monopoly.

The news, so far, is all bad for AT&T. AT&T is vulnerable to RBHC competition in long-haul and information services, and also in manufacturing. The RBHCs have major territorial and geographic advantages in the provision of long-haul and information services within their regions.

Currently, AT&T's equipment sales to the RBHCs represent approximately 70% of its total production. Any manufacturing relief given to the RBHCs may cause AT&T's sales to the RBHCs to plummet.

Users are destined to benefit. The information age along with Open Network Architecture and the Third Computer Inquiry guarantee them open access to the telecommunications and information infrastructure at established, tariffed rates.

As a result, the industry will look back on the Appeals Court's remand of Greene's line-of-business restrictions opinion as a milestone when industry structure was changed, the RBHCs' business dreams were unleashed and the information age took a giant step forward.

Pearce is president of Information Age Economics, Inc., a telecommunications research firm in Washington, D.C.

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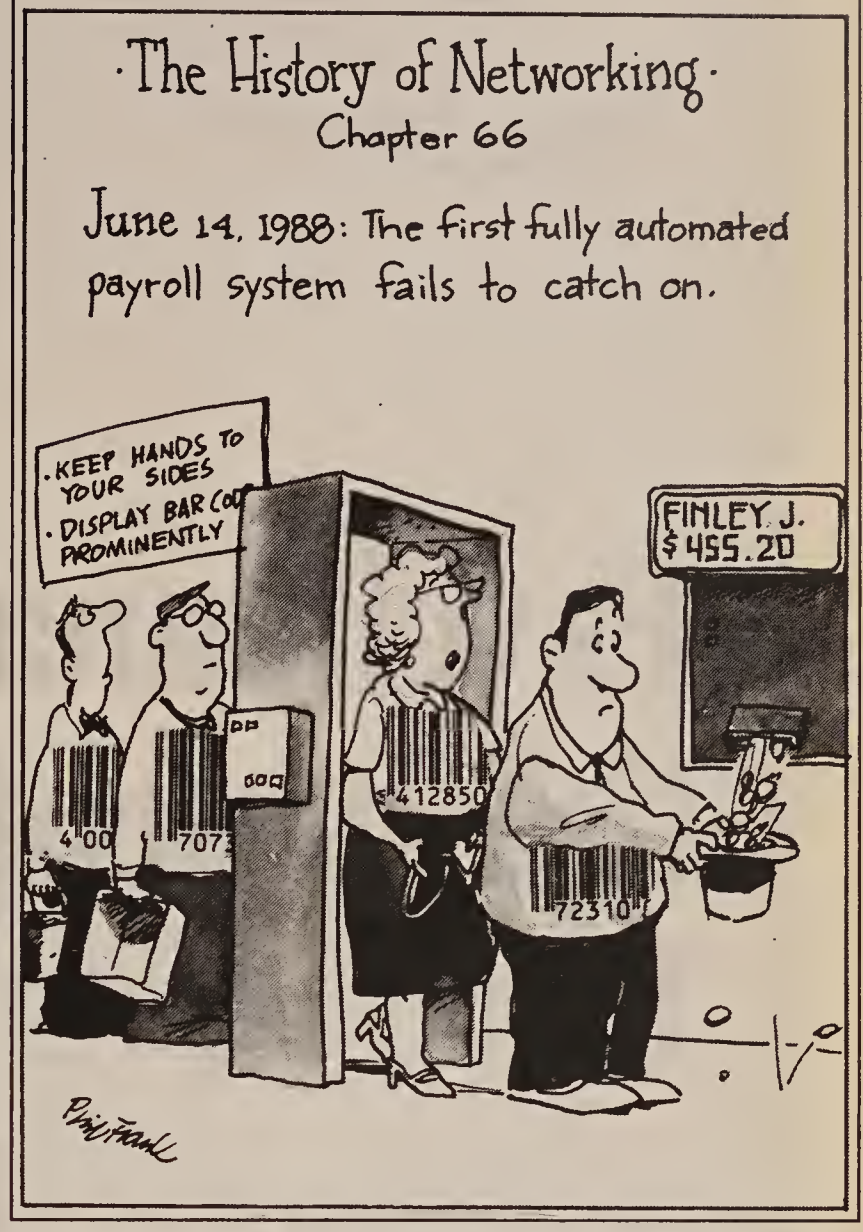
TELETOONS

BY FRANK AND TROISE



LETTERS

Aggregation issues

Kudos on your Buyer's Guide on the emerging long-distance aggregator industry ("Aggregator plans offer big savings," *NW,* April 16).

Your article contained more useful information than was provided at a recent two-day conference on third-party marketing that attempted to address the same aggregation subject. Some 300 attendees paid big bucks for "information" that was focused primarily on pitching the merits of becoming a subaggregator, or sales agent, for an aggregator.

The conference planners got the best of the deal; they made some nice bucks while issuing written and verbal disclaimers and warnings about the accuracy of the information provided.

Nevertheless, the "turned-on" attendees will probably try to get into the aggregation business. And others will probably sign up for sales agent status, hoping for fat commissions on supposedly fat margins.

Others in the crowd doubted certain conference speaker statements about becoming millionaires in a year or two but gave credence to the potential regulatory, legal, financial, telecommunications/business experience and life cycle implications associated with an aggregation business.

Some additional questions to ponder: Why hasn't AT&T offered a clear statement regarding its official position on aggregation? Is it now grappling with a soon-to-be-out-of-control subagent selling discount long-distance services on street corners? Does it intend to pull the plug at some point and leave a stranded base of customers to switch back to direct AT&T account coverage or to the competition?

Surely, these issues should be in the buyers' (and providers') minds. Yet AT&T ap-

(continued on page 62)

Network World *welcomes letters from its readers.*

Letters should be typed, double-spaced and sent to Editor, Network World, *161 Worcester Road, Box 9172, Framingham, Mass. 01701.*

Letters may be edited for space and clarity.

Network World and LanQuest

LAN TEST SERIES

LAN protocol analyzers

Psychoanalyzing the neurotic LAN

As local-area networks have evolved into complex distributed systems, the problems they present to users have grown equally complex. Off-the-cuff diagnoses are no longer adequate. Network managers must perform careful in-depth analyses to determine the causes underlying LAN symptoms.

While psychoanalysts make diagnoses using the knowledge stored within their own minds, network managers can draw on a range of sophisticated diagnostic tools, the most powerful being LAN protocol analyzers.

This is the first in a series of articles that will examine the current crop of LAN protocol analyzers. This report presents first impressions based on limited use of the machines in a simple test environment. A later article will contain a thorough assessment of the analyzers' performance in various test situations.

Analyzer functions

Network managers use LAN analyzers for active network monitoring, data capture and display, traffic generation, cable testing, and system configuration and management.

■ **Network monitoring.** With this function, the user can observe the network in real time to see what is happening on it and to monitor it for unusual events that might indicate problems.

Typically, monitoring is done with either a graphic or numeric summary display designed for easy reading. LAN analyzers usually perform network monitoring on three levels: system, channel and packet.

The system-level monitor display typically includes date, time and several measures of network utilization, including packets per second, kilobytes per second and current network utilization. It also includes a summary of network activity, including such information as total packets sent, packets received and errors.

Several analyzers provide graphic summaries of network activity on a time-sampled basis. Many also optionally provide a graphic summary of the distribution of packets by size.

The channel-level monitor display shows the activities of selected nodes on the network using the information described above.

The packet-level monitor display generally includes the following information: packet number (supplied by the analyzer), packet size, time received, source, destination, type of message and message content.

■ **Data capture and display.** Analyzers can capture and save data in a capture buffer, sometimes called a trace buffer, which is a random-access memory storage area used to store filtered packets. The user can then examine them in detail on a one-by-one basis, a method that is particularly useful for analyzing problems. Most analyzers can also save data to disk for later playback and analysis.

Hardware filters, which are used to select packets to be captured for analysis, operate in

(continued on page 48)

The user interfaces and functionality of protocol analyzers vary greatly.

By COLIN MICK

Mick is vice-president and general manager of the services division of LanQuest Group Corp. in San Jose, Calif.

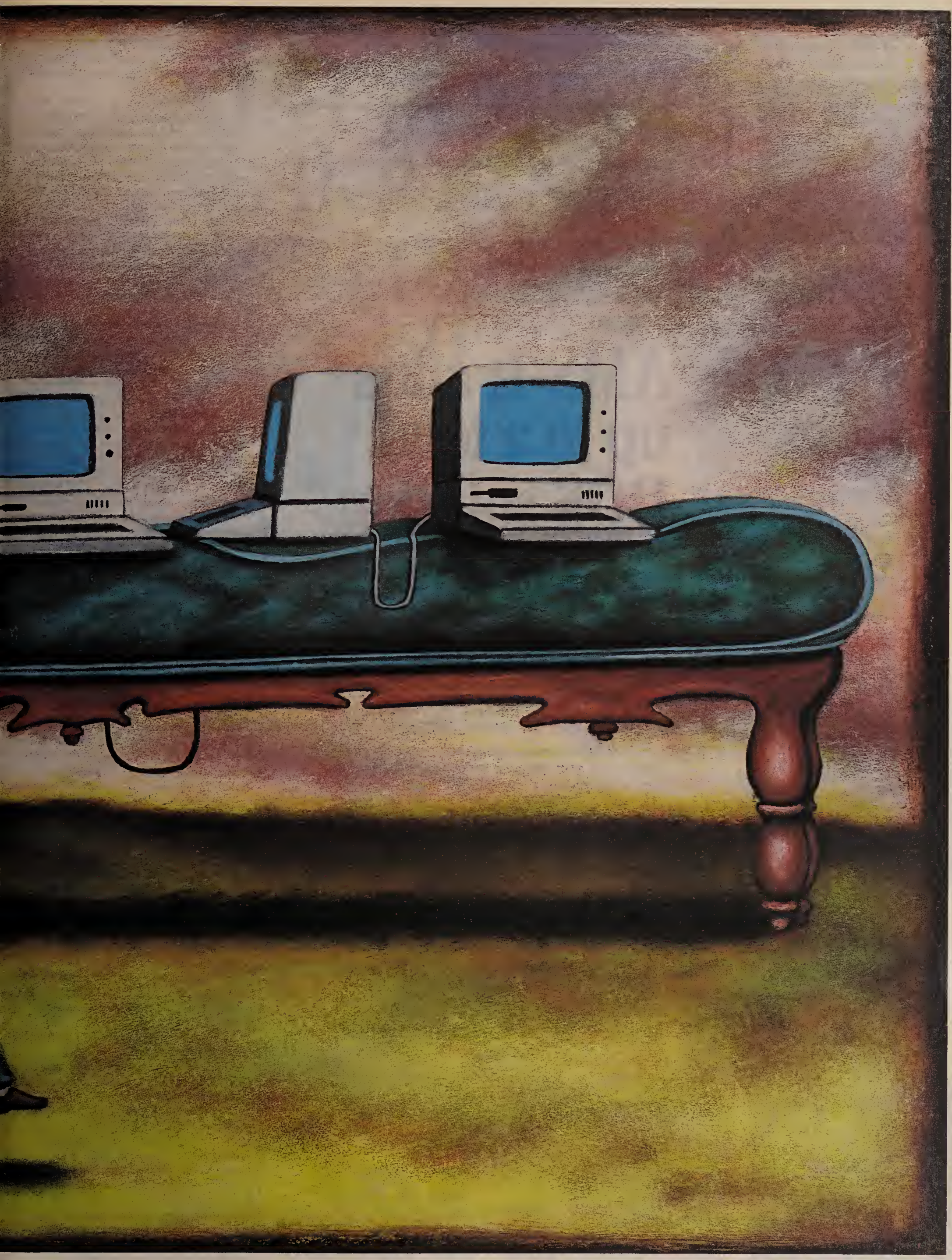


ILLUSTRATION ©1990 WARREN GEBERT

(continued from page 46)
both inclusion and exclusion modes. Most analyzers allow users to filter packets by

network address, by protocol or by some data pattern.

Some analyzers provide predefined filters, some allow the user to create them and some enable the user to select a previously saved packet to use as a filter.

Triggers are similar to hardware filters, but they are used to start loading packets into the capture buffer. Most can be programmed to begin collecting packets at a specific time or when a specific event occurs.

Triggers work like hardware filters and can be preprogrammed to act on addresses, protocols or data patterns.

LAN analyzers vary in how they store each packet in the capture buffer. Some save the entire packet, while others use a technique called slicing to save only a portion of the packet, typically the front portion, which contains all the management information.

Some allow the user to do both. With slicing, the user can capture more packets. In addition to a RAM capture buffer, most analyzers allow the user to save the captured data to disk. However, the user must suspend the capturing process to make the transfer. Some analyzers also allow the user to define several buffers.

Software filters, similar to hardware filters, select data from the capture buffer when it is displayed. By using a software filter, the user can set a wide capture filter net initially and then view only selected portions of the captured packets on the display.

Packets are typically displayed in summary form, giving the packet number (indicating the packet's sequence in the capture buffer), time of capture, source, destination and size of packet. Net managers can also view packets in detail, giving them an opportunity to see each byte.

> LAN analyzers with a TDR function are generally less accurate than separate TDRs or cable analyzers.
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■ **Traffic generation.** This function is used to send packets across the network. These generated packets can be random packets designed to simulate additional traffic load, created packets used to test the system or copied packets retransmitted to recreate a specific problem.

■ **Cable testing.** Most protocol analyzers test network cabling for shorts and breaks via Time Domain Reflectometry (TDR), which sends a signal through the cable.

A short or break in the cable creates an echo, which travels back to the analyzer. The delay between sending the signal and receiving the echo is then analyzed to estimate how far the short or cable break is from the analyzer. LAN analyzers with a TDR function are generally less accurate than separate TDRs or cable analyzers.

■ **System configuration and management.** With this function, the user can customize the LAN analyzer to a specific environment or task. One customization feature, network node definitions, allows users to assign more understandable end-user names, such as "Bob Johnson," to specific adapter addresses. This feature makes the results easier to interpret and understand.

Data base management functions allow users to save capture buffers to disk for later examination or analysis. Most LAN analyzers have only a limited ability to organize and report collected data. Some, however, provide routines that convert this data so it can be processed by data base or spreadsheet programs. Therefore, a crucial feature would be compatibility or data importability relative to specific data base management software or spreadsheet packages.

Typical users

There are three categories of potential LAN analyzer users: network managers, technicians and developers.

A network manager is responsible for overall network management and operation but functions in an administrative or managerial role, rather than providing hands-on technical support. However, in companies with smaller networks, where a technician may not be justified, the network manager might also provide technical support. This manager needs a flexible, easy-to-use LAN analyzer with an intuitive interface and good on-line help.

A network technician deals daily with

(continued on page 50)

AT&T announces striking savings on an unmatched digital service.

Did you know that in 1989, AT&T slashed prices of its ACCUNET® Switched Digital Services (SDS) by up to 74%? When you consider that AT&T is the only vendor that can offer your business the advantages of a public switched digital service, that figure is doubly impressive.

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(continued from page 48)

hands-on, technical LAN problems. Again, flexibility and ease of use are important, but the technician will be more technically demanding of a LAN analyzer and require more analytic power.

A network developer, who develops and tests products to function on a network, requires heavy-duty analytic power. Flexibility and ease of use are less important than absolute accuracy and the ability to perform under high load factors.

Protocols supported by 7 LAN analyzers

Figure 1

Protocols supported	Cabletron Systems, Inc.'s LANview	Digilog, Inc.'s LANVista	Hewlett-Packard Co.'s HP 4972A	Network General Corp.'s Sniffer	Novell, Inc.'s LANalyzer	Spider Systems, Inc.'s Analyzer 320	VANCE Systems, Inc.'s ATS 1000
AppleTalk	✓	✓		✓	✓		
DECnet	✓	✓	✓	✓	✓	✓	
802.5				✓	✓	✓	✓
Ethernet	✓	✓	✓	✓	✓	✓	
NETBIOS		✓		✓			
Network File System			✓				
Novell	✓	✓	✓	✓	✓	✓	✓
OSI	✓			✓	✓	✓	
SNA		✓					✓
Starlan			✓	✓			
TCP/IP	✓	✓	✓	✓	✓	✓	✓
VINES	✓			✓			
Xerox Network Systems/ MS-NET	✓	✓	✓	✓	✓		
Decode layers		1-7		1-7	1-4	1-4	1-7

GRAPHIC BY SUSAN SLATER

SOURCE: LANQUEST GROUP, SAN JOSE, CALIF.

The analyzers

This article compares and contrasts seven LAN analyzers: Cabletron Systems, Inc.'s LANview, Digilog, Inc.'s LANVista, Hewlett-Packard Co.'s HP 4972A, Network General Corp.'s Sniffer, Novell, Inc.'s LANalyzer, Spider Systems, Inc.'s Analyzer 320 and VANCE Systems, Inc.'s ATS 1000.

■ **Cabletron's LANview.** LANview comes as a kit: a custom Ethernet interface card (PCLINK-2A), two manuals and floppy disks containing the software.

LanQuest installed it in a Zenith Data Systems Corp. 386SX with a video graphics adapter monitor, and installation was a snap. Once the card was installed and the software loaded, the program came up immediately and worked like a charm. LANview comes with a user's manual and a protocol manual.

> LANView appears to be a more appropriate tool for the LAN manager than for a high-end technician or researcher.
>
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LANView's software is cursor key-driven and easy to use. However, it has no extended memory support, which limits the size of the capture buffer. On the other hand, LANView allows the user to collect and view captured data simultaneously.

Although it supports Apple Computer, Inc.'s AppleTalk, it does not support either AppleTalk Phase 2 or LocalTalk.

LANView appears to be a more appropriate tool for the LAN manager or technician than for a high-end technician or developer. This puts it in a niche where it competes directly with the Sniffer, LANalyzer and LANVista.

■ **Digilog's LANVista.** The LANVista system is available either as a kit (master software and slave board), as a single, prepackaged, stand-alone unit and as packaged remote slaves plus the master control software.

LanQuest's LANVista came prepackaged as a stand-alone unit in a portable Dolch Logic Instruments, Inc. 80386.

The software includes an extensive context-sensitive on-line help system, which appears to be at least the equivalent of the manual.

The most interesting feature of the LANVista is its modularity. The system is based on a custom board (called a slave board) and a set of master station software. LANVista can be configured with the slave card and the master software in a single unit or with the master software installed in a central unit and one or more slave boards installed in distributed stand-alone units with their own power supplies.

Unlike other remote units that function primarily as passive monitors, the LANVista slaves are full-functioning analyzers that can perform any task run from the master unit. Communications between slaves and the master can be either over the LAN or by an RS-232 link, permitting remote troubleshooting and analysis even when the network is down.

This distributed system is flexible and allows the network manager to place slaves on different LAN segments and manage them from a single personal computer-based master station.

Topologies supported by seven LAN analyzers

Figure 2

Topologies	Cabletron Systems, Inc.'s LANview	Digilog, Inc.'s LANVista	Hewlett-Packard Co.'s HP 4972A	Network General Corp.'s Sniffer	Novell, Inc.'s LANalyzer	Spider Systems, Inc.'s Analyzer 320	VANCE Systems, Inc.'s ATS 1000
Arcnet				✓			
Ethernet	✓	✓	✓	✓	✓	✓	
LocalTalk				✓			
Token ring 4M bit/sec		✓		✓	✓	✓	✓
Token ring 16M bit/sec							✓

GRAPHIC BY SUSAN SLATER

SOURCE: LANQUEST GROUP, SAN JOSE, CALIF.

The LANVista seems to be targeted at technicians maintaining an enterprise network, where its distributed power can be put to best use. The user interface is a little more difficult to master than either the Sniffer's or LANalyzer's, and the device is better at analysis than monitoring.

■ **The HP 4972A.** The HP 4972A comes as a single package and is essentially an engineering tool designed to analyze Ethernet traffic. It is housed in a relatively standard HP 4972A analyzer case, providing a small display screen and keyboard. There is a 3½-in. floppy drive, but the machine is not DOS-compatible.

The HP 4972A proved to be the documentation champ. It comes with a collection of manuals including a user's guide, a reference manual, appendixes and utilities. In addition, there are separate manuals for each of the supported protocols: Xerox Corp.'s Xerox Network Systems, Transmission Control Protocol/Internet Protocol, DECnet and Network File System.

The HP 4972A has only a rudimentary function-key-based user interface and delivers cryptic on-screen messages. Although the product has many configuration options, setting up and changing experiments was not intuitive and required frequent consultation with the manuals.

Once an experiment was installed, moving through the various options via function keys was not complicated, but the lack of on-line help made it difficult to understand the options without returning to the manuals.

For example, switching from monitor to capture mode required loading different experiments into the machine. Loading experiments is menu-driven but requires more effort than the more user-friendly interfaces of the LANView, LANVista, Sniffer and LANalyzer.

The HP 4972A keyboard is smaller than a standard personal computer keyboard with easy-to-understand soft-coded function keys, but the key placement takes some getting used to. Since this machine would have the most appeal for those who would use it regularly, users could probably get by with minor familiarization.

The HP 4972A analyzer is not designed for casual users. It is a professional tool that would be most useful for an experienced technician or a network developer who uses it on a regular basis.

■ **Network General's Sniffer.** The Sniffer comes in a Compaq Computer Corp. 386/20 configured for both Ethernet and 4M bit/sec token ring.

The Sniffer comes in second to the HP 4972A in documentation. The Sniffer's documentation includes separate hard-covered spiral-bound manuals for Ethernet and token ring, plus application notes and tips.

The Sniffer comes with 4M bytes or 6M bytes of expanded memory, which provides quite a large capture buffer. The software is menu-driven and relatively easy to use.

The product is the only analyzer covered in this article that comes with both thin net and thick net interfaces for Ethernet.

The Sniffer currently offers the best Macintosh support of the analyzers listed here. In addition to supporting the AppleTalk protocol with full decoding of AppleTalk Phase 2 packets, it is the only unit that provides LocalTalk cabling support.

The Sniffer provides broad support of topologies and protocols and an intuitive, easy-to-use interface. Its flexibility and ease of use make it a good choice for a network manager or technician.

■ **Novell's LANalyzer.** The LANalyzer is available in kit form (an Exos 325 Network Analyzer Board plus LANalyzer system software) or as an integrated system with the board and software installed in an 80386-based NEC America, Inc. PowerMate Portable SX computer.

A 4M bit/sec token-ring version, the Exos 325TR, is also available, as is a Starlan adapter. Our unit was the integrated system equipped with the Exos 325 board for Ethernet networks.

The LANalyzer documentation comes in a soft-cover spiral-bound reference manual and offers an application library. Novell provides a separate reference manual for token-ring networks. In addition, the LANalyzer comes with built-in on-line help.

The terminology used in the LANalyzer's documentation differs from that used in other documentation. For example, the material uses the term "channels" to refer to hardware filters. However, the basic functions are similar to the others covered here.

The LANalyzer uses a line-sensing algorithm to spot signals moving over the network. This allows the LANalyzer to detect packets with bad or incomplete headers that would be missed by all the other analyzers except the VANCE ATS 1000, which "sees" everything on the network through its bit-sliced CPU.

The result is that the LANalyzer gives a more accurate network utilization measure than the other Ethernet analyzers in this study.

The LANalyzer offers limited Apple Macintosh support. Although it supports the AppleTalk protocol, it does not support Phase 2 or LocalTalk.

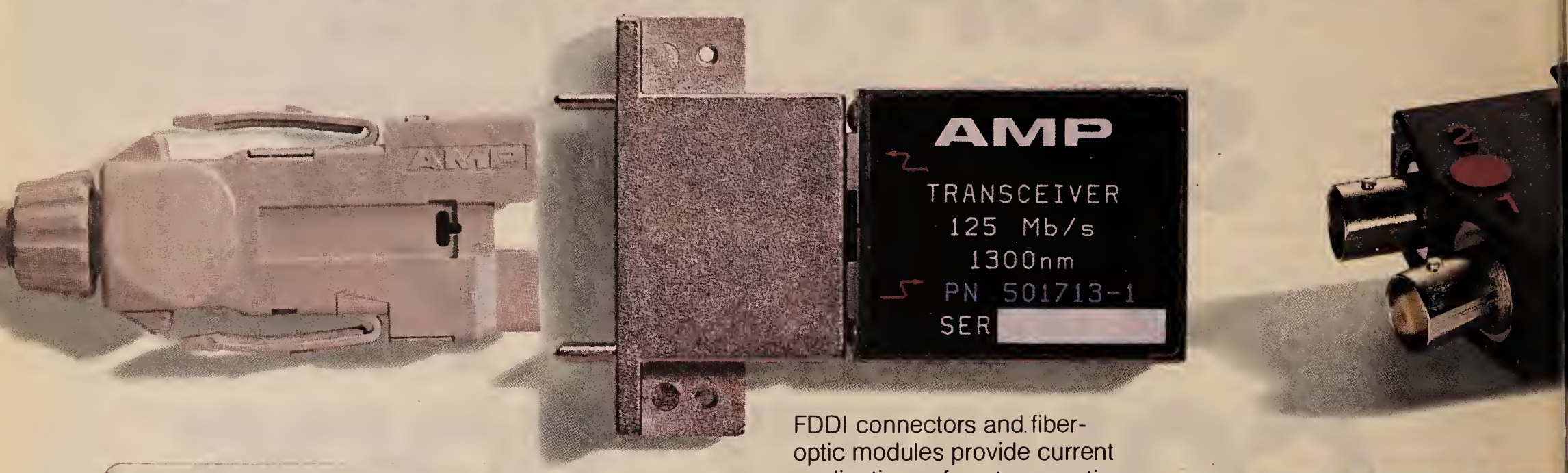
The LANalyzer's easy-to-use user interface relies on a combination of menus and soft-programmed function keys. Setting up and changing options are very simple, straightforward procedures.

The LANalyzer straddles the line between being a tool for the network manager and the network technician. It has the ease of use and flexibility that make it attractive to the LAN manager.

(continued on page 55)

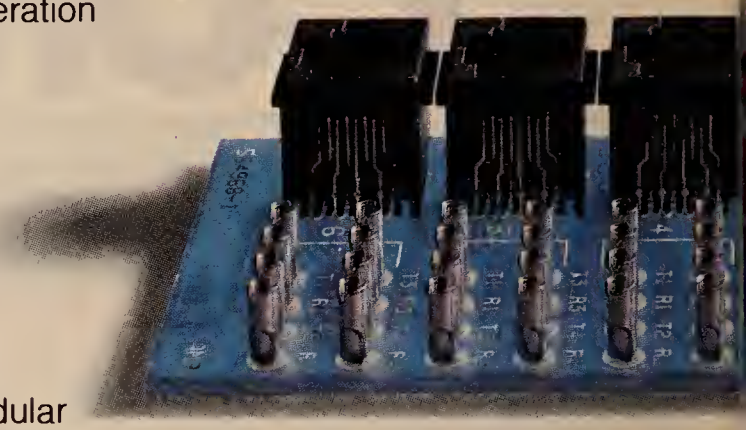
FOR YEARS, OUR NAME STOOD FOR QUALITY CONNECTORS.

TODAY, IT
FOR A WHOL



FDDI connectors and fiber-optic modules provide current applications of next-generation technology.

Interchangeable connector inserts accept equipment from any major vendor, allowing in-office or wiring closet changes in seconds.



Uncomplicated wiring management: our modular cross-connect allows simple "jumper" reassignment for twisted pair voice and data.

Today, you'll find AMP technology every place you look in the networking environment. In fact, we provide and support complete premises wiring packages for any network, regardless of media mix or vendor mix. And we simplify wire management at the same time.

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AMP baluns simplify the interface between coaxial and twisted pair cabling.

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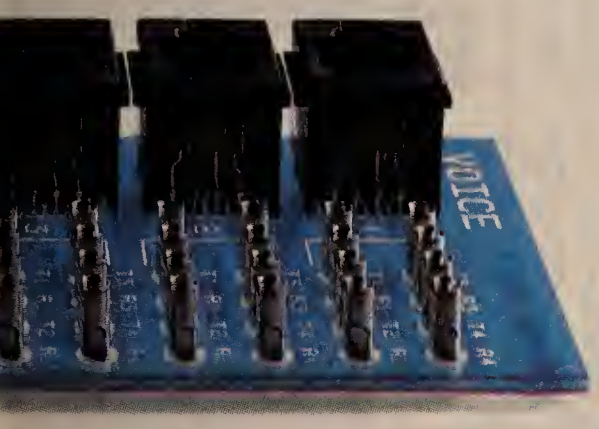
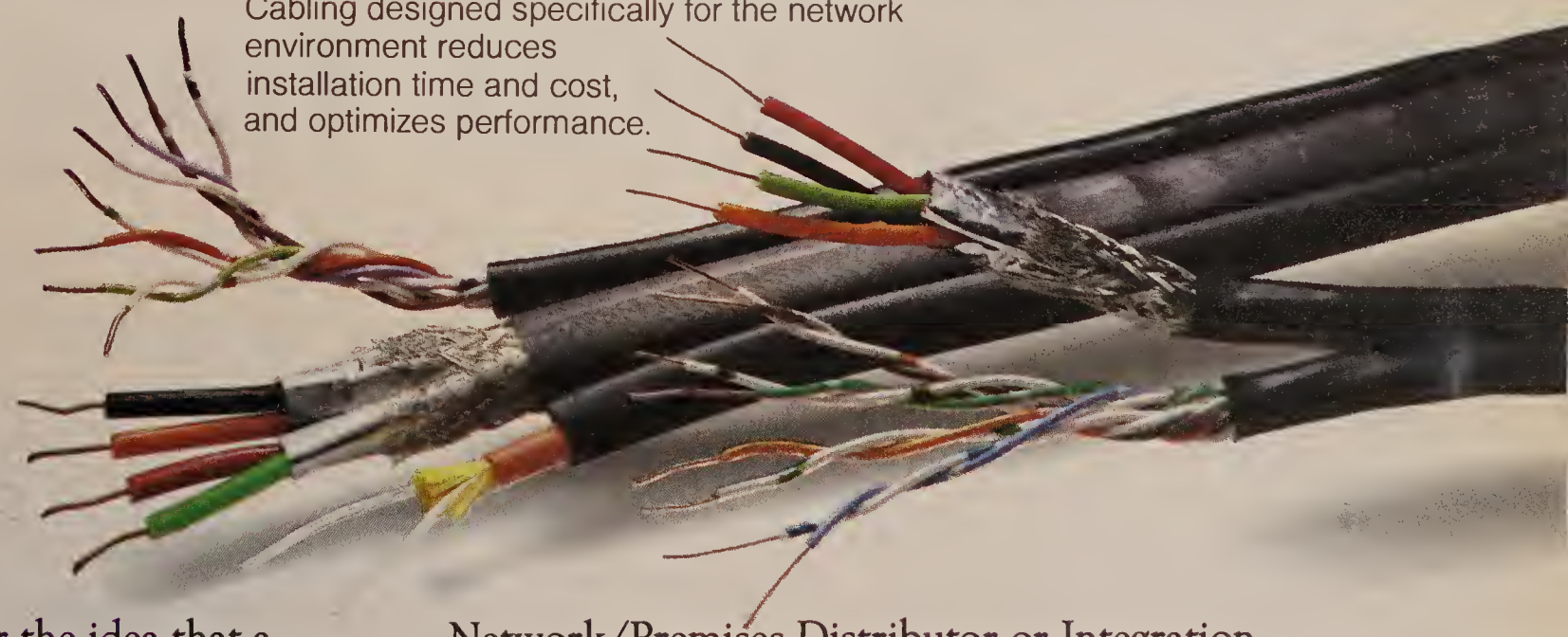


Our Thinnet Tap System features self-shunting connections for quick, easy connect/disconnect in Ethernet/IEEE 802.3 10Base2 networks.

AMP standard and special-purpose patch panels reduce wiring closet complexity, and speed change.

Cabling designed specifically for the network environment reduces installation time and cost, and optimizes performance.



Today, our name stands for the idea that a network should be robust at its most fundamental level — and that premises wiring should be as advanced as the hardware it supports.

For more information and the name of the AMP Network/Premises Distributor or Integration Partner near you, call our Product Information Center at 1-800-522-6752. AMP Incorporated, Harrisburg, PA 17105-3608.

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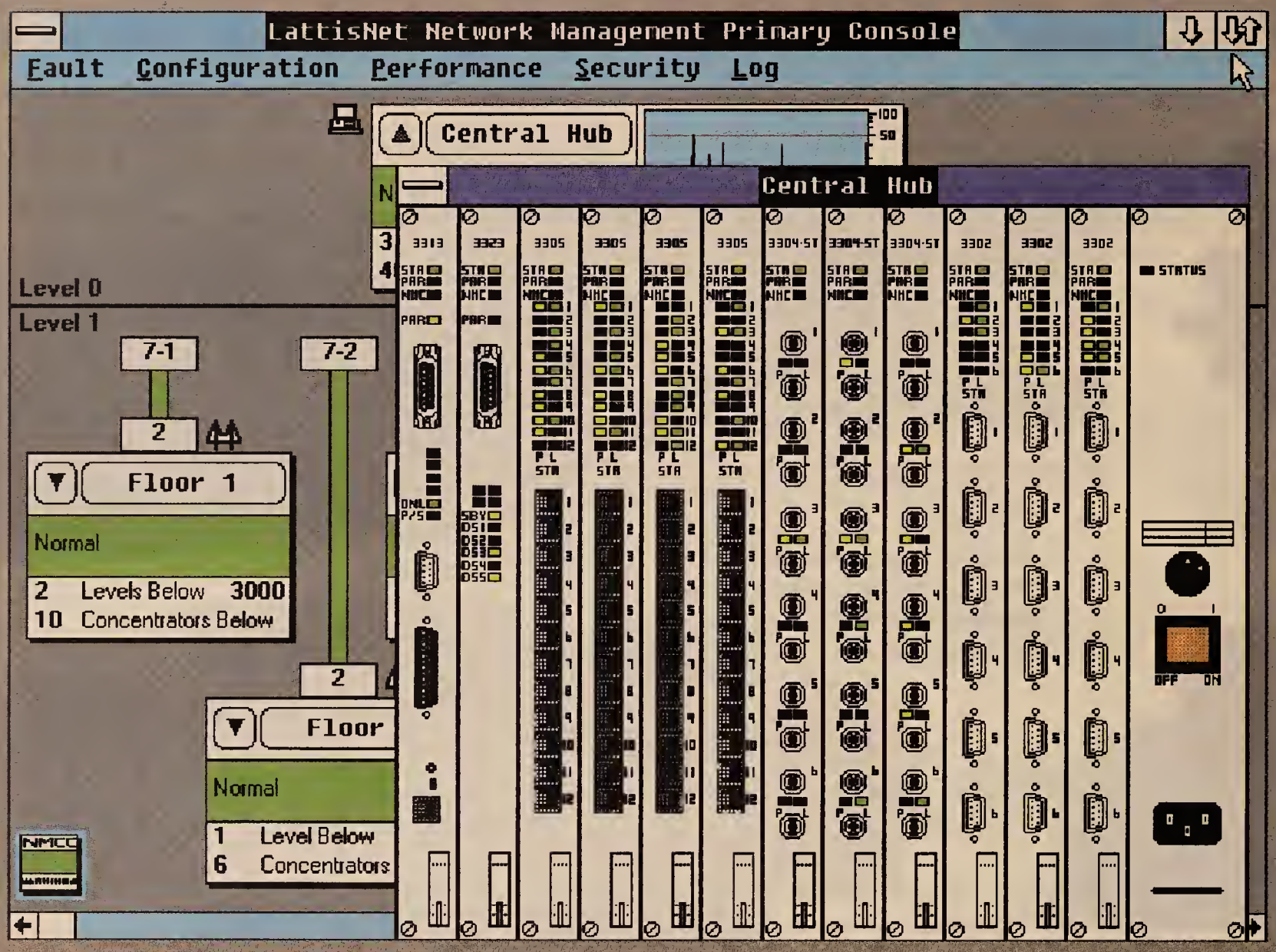

The expanded view features a detailed, real-time display of a LattisNet System 3000 concentrator.

IN REAL TIME.

The LattisNet Network Management system lets you maximize network up-time by monitoring, controlling and planning your network's physical layer – in real time – from a central control console. LattisNet Network Management automatically creates a real-time map of your entire network so you can monitor all or any part of your network at a glance. Network utilization data is updated continuously and built-in diagnostics automatically find and isolate faults, saving you time in troubleshooting and helping you keep your network up and running.

An expanded view feature offers a detailed, real-time display of your LattisNet concentrators, allowing you to manage individual network connections. Problem segments and nodes can be partitioned from the network to avoid catastrophic failures and maintain high service levels.

LattisNet Network Management lets you learn about the network from the network itself. User-definable thresholds let you determine acceptable activity and error levels for the network. If a threshold is crossed, the system alerts you immediately, keeping you one step ahead of potential problems. And best of all, LattisNet Network Management captures and stores vital information for future analysis and network planning.

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See The FAXNet Form on Page #72

(continued from page 50)

■ **Spider's Analyzer 320R.** The Spider Analyzer 320R comes in a Compaq 386/20 portable personal computer. The model Spider sent for testing supported only token ring. However, a similar model is available for Ethernet.

The Analyzer 320R uses a menu/function-key user interface like most of the other personal computer-based analyzers in this group, but we found it more difficult to use. The F9 and F10 keys are used to select options in the menus, but they are labeled "Next" and "Previous," which took some getting used to, as does starting operations with a "Run" key rather than a simple "Enter." There is no on-line help, making the job of navigating around the menus more difficult.

The Spider Analyzer 320R belongs right in the middle of the pack. It seems more geared to the needs of a LAN manager or technician than a researcher. It lacks the sophistication and power of the HP 4972A or the VANCE ATS 1000 product, which would appeal to a highly technical user. But, like the Cabletron LANView, it is less user-friendly than the Sniffer, LANalyzer or LANVista.

If the LAN analyzer is to be used by several users with varying levels of experience, then a menu-based user interface might be more appropriate.

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■ **VANCE's ATS 1000.** Like the HP 4972A, the VANCE ATS 1000 is a custom-built unit; however, it is unique among the analyzers tested in that it does not use a standard LAN interface chipset. Instead, the ATS 1000 interfaces to the network with a special bit-sliced processor.

This technique has two major advantages: The ATS 1000 is absolutely invisible on the network, and it "sees" all the data passing over the network, including partial packets and packets with incomplete headers. Other analyzers can't see such packets because they look at the network through a network interface card.

Our ATS 1000 was set up for a 4M bit/sec token-ring net, but VANCE also offers a 16M bit/sec token-ring version and has announced an Ethernet version. The LCD screen and keyboard that come with the ATS 1000 are detachable, and the unit supports an alternate color monitor.

The ATS 1000 user interface is more like that of the HP 4972A than those of the other analyzers covered here.

To perform a specific function with the ATS 1000, the user executes experiments — predefined function setups — instead of selecting options from a series of menus. By calling up an experiment listed in the experiments menu, the user can modify the parameters to fit the situation, thus customizing the predefined configuration. The user can then save the modified experiment to disk for later use.

With the network menu, the user can configure the analyzer to a specific network's protocol stack. The utilities menu provides basic computer management services such as backup and disk formatting.

In ease of use, the ATS 1000 user interface falls somewhere between the HP 4972A and the other analyzers. Thanks to the menu-driven functions, it is easier to use than the HP 4972A, but it requires more setup work than the LANView, LANalyzer, LANVista, Sniffer or Analyzer 320R.

The difference between the ATS 1000's user interface and the type of interface that the other analyzers covered here typically use is similar to the difference between writing a batch file to perform a series of operations and performing the same operations individually under menu prompting. The former approach can be much easier if the user plans to run the same functions many times, but it requires additional setup.

For a well-organized, experienced user or a small group of users required to frequently perform the same set of functions, this approach is the best way to go. However, if the LAN analyzer is to be used by several different users with varying levels of experience to perform a variety of tasks, then a menu-based user interface might be more appropriate.

We also had some problems executing commands. The VANCE ATS 1000 keyboard deserves special mention because its layout is quite different from a standard personal computer keyboard. Function and cursor control keys are located above the keyboard in a layout that experienced personal computer users will find strange. We found it somewhat difficult to use, even more so than the HP 4972A.

The ATS 1000 feels like the token-ring counterpart to the HP 4972A. It emphasizes power and experimental rigor over ease of use. Like the HP product, it would appeal primarily to network technicians and researchers who would use it on a daily basis.

Although all perform essentially the same tasks, the variation among LAN analyzers is staggering.

LAN analyzers can be configured and used to obtain valuable LAN management information in a surprisingly short period of time. But subtle differences in the user interface can make a big difference in how easily and quickly the user "comes up to speed." ◪

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UNLEASH THE POWER WITH

Users peeved over switched access rules

continued from page 35

al Private Network (GVPN) offering ("US Sprint's international virtual private net bows," *NW,* April 30).

The carrier says switched digital service will cost the same as an international telephone call. But in order to use GVPN, users will have to maintain T-1 links into both US Sprint's network and the net of the foreign carrier.

Pluses, minuses weighed

Such access requirements could short-circuit some smaller users' plans to employ switched international services, but they won't deter larger companies.

Larry Ehlers, manager of plant engineering with the Olathe, Kan.-based aircraft electronics maker Bendix/King, a division of Allied-Signal, Inc., said his firm is planning to use US Sprint's switched digital service to support videoconferences linking headquarters and a manufacturing plant in Singapore.

He estimated that the cost of using GVPN would total only a few hundred dollars a month, compared to the $2,000 an hour his company currently spends to support a T-1 link from a public videoconferencing room in Singapore to corporate headquarters.

Dasgupta said Shearson is examining the possibility of using switched international digital service from AT&T to back up dedicated circuits to London and other cities. "This gives us the ability to engineer in more redundancy at a better price," he said.

But Dasgupta and other users said they are frustrated that foreign carriers are forcing them to utilize ISDN services in foreign countries in order to access AT&T international switched digital services. For example, in the U.K., users must subscribe to a proprietary, ISDN-like service from British Telecommunications PLC to receive switched digital transmissions from AT&T.

Dasgupta said the terminal equipment his firm would have to use on the U.K. end of the link probably would not be compatible with the network management system used to monitor transmissions on the company's private-line links. He said this would decrease the amount of control Shearson has over its international network.

SNA compatibility problems

Ritscher complained that ISDN terminal equipment used abroad may not be compatible with his firm's Systems Network Architecture network and could be expensive.

Dasgupta said another negative is that users are required to maintain T-1 links to carrier points of presence in order to use the US Sprint international switched digital service.

"It increases your investment costs, which may not be so bad for a big company like ours but could be a real burden on mid-size companies, which are the ones that really stand to benefit from using these services," he said.

Bridge supports Spanning Tree

continued from page 39

cally detects packets that do not contain source routing information and inserts a routing information field so the packets can be bridged across IBM LANs. The routing information field lists the token rings and bridges in the order in which the frame will traverse them.

The dynamic conversion mode will help users that otherwise would have had to perform software upgrades to implement SRT. Source routing users that want to use SRT will also have to perform a token-ring interface upgrade because current source routing bridges do not support the hardware-based address lookup function defined under SRT. That address lookup is currently supported on Spanning Tree bridges. Although the IEEE has not finalized the SRT standard adopted by CrossComm, IBM's timetable calls for adoption by July, according to Larry Samberg, vice-president of engineering at the company.

Samberg added that potential CrossComm users do not need to worry about changes in the standard because software revisions can be downloaded remotely.

LANs that require IBM source routing can be bridged to one another in HSB-RR's source routing mode, and LANs that do not support source routing can be bridged in HSB-RR's Spanning Tree mode.

HSB-RR is expected to be available in July for $7,950.

CrossComm can be reached by writing to P.O. Box 699, Marlborough, Mass. 01752, or by calling (508) 481-4060.

Dialogue

continued from page 29

forces you to examine the efficiency of your own operation and make the best decision for the organization.

"If you choose not to outsource, the exercise [of examining network operations] is valuable.

"If you decide to outsource, then there is probably good reason."

Steve Davidson
Chief of computer operations
Prince William County
Woodbridge, Va.

"Outsourcing is a strategy whose time has come.

"Network managers worthy of their positions should view outsourcing as just another tool in their bag of tricks. These days, managers who do communications for its own sake won't have a job for long.

"Their focus should be on providing communications services that support the company's business objectives."

Tom Mulgrew
Manager of network design
Chevron Information
Technology Co.
San Ramon, Calif.

"Most network managers view them as a threat, but they are here to stay. The operational benefits of outsourcing will justify their existence.

"In the future, network managers will focus more on designing and fine-tuning the network, while network operation and maintenance will be handled by outsourcing vendors.

"Virtual networks are a form of outsourcing, and they will continue to grow in popularity."

Dennis Murphy
Director of telecommunications
Time-Warner, Inc.
New York

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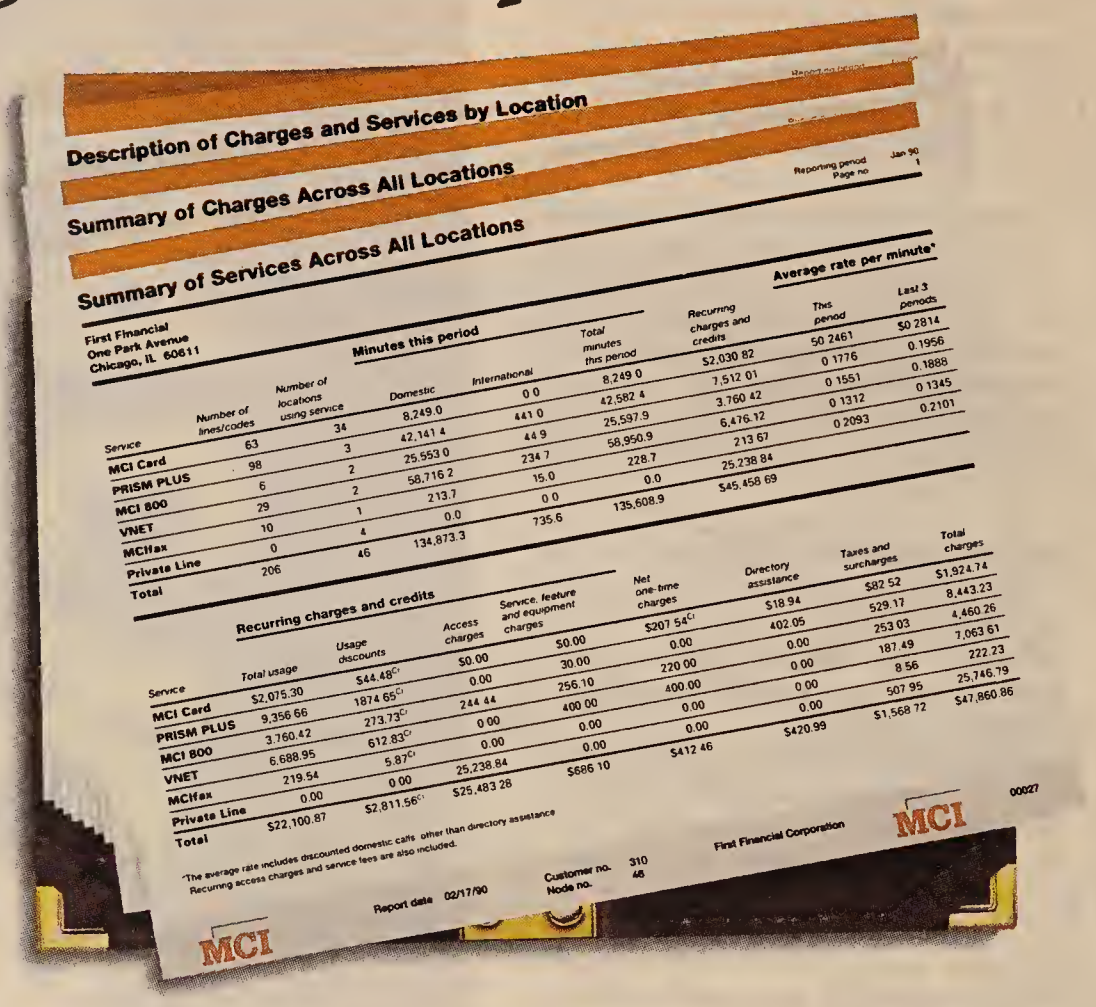

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The human side of network management

Successful net managers are adept at handling their most valuable resource — people.

CONTINUED FROM PAGE 1
changes, at least until they've been fully tested. This conservatism can seem like unnecessary opposition to a department manager who badly needs a hot new piece of software to complete a specific project.

Things can be smoothed out considerably by explaining to the manager that thorough testing before installation will, in the end, not only prove to be a wise investment for both of you, but will also save everyone concerned a lot of time.

Effective network managers are those who continually remind themselves that their primary job function is to support network users.

One tactic is to tell yourself that the network users are your clients and, therefore, deserve your best support efforts. The attitude you have regarding your job will affect the way you perform your duties.

User attitudes

Personnel involved with a large corporate network will have a variety of attitudes toward the system. Those with previous personal computer experience may resent what they see as the net manager's attempt to control

(continued on page 60)

Hartman is a computer specialist with General Physics Corp., a training and consulting services company in Aiken, S.C.

(continued from page 59)
their computing resources. Others with minimal personal computer experience may be afraid to venture beyond even the simplest menus.

Tailored support

The effective network manager is aware of the variety of user attitudes and can tailor support according to individual user needs.

What may work for an experienced personal computer user may not necessarily work with a novice. Users with experience on personal computers and programs may need only network familiarization training.

In this case, develop a simplified network drive and directory layout that the experienced new user can quickly start to use. Try to use terminology that is easily understandable; use analogies, but don't talk down to them.

End users will be sensitive to this. A condescending attitude will quickly damage your rapport with certain experienced or sensitive personnel.

Your purpose as a network manager doesn't have to be a mystery to network users. With a little thought, you should be able to define your function in two sentences.

For example, in a large graphics and publishing environment, the net manager's function is to provide support to the users, to act as technical liaison to hardware and software vendors, and to protect the company's investment in the system. The network's function is to provide editing and graphics capabilities for production of the final documents.

Don't be afraid to teach your users some of the tips and tricks that you've picked up. Your net will have enough activity and variety to ensure that you will always have new things both to learn and to teach.

The need for training

The network manager should continually stress the need for further end-user training. This training may be acquired in a variety of ways; the network manager need not assume the burden of training all end users.

Encourage experienced personal computer users on the network to help inexperienced users. The personnel within a given department know the needs of their production environment and supervisor far better than you ever will.

Give verbal recognition of user efforts directly to the user's supervisor or by sending a short departmental note or memo. The network manager's reward will come through helpful employee attitudes and increased productivity on the network.

On the other hand, if you or the user's supervisor discourage or downgrade the efforts of "superusers," this can have adverse effects in the office. Well-trained workers who see no reward for their proficiency may decide to let new personnel in the department learn the hard way, "Just like I did."

Well-trained workers who see no reward for their proficiency may let new personnel in the department learn the hard way.

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Products that require long learning curves such as Xerox Corp.'s Ventura Publisher and Autodesk, Inc.'s Autocad can be disheartening to the new user.

The friendly voice from the back of the office telling new users quietly how to resolve difficulties can save the net manager from having to deal with a lot of phone calls from users making vague claims that the computer is broken again.

Approaching end users with the attitude that they are at fault and must be chastised may lead the user not to tell you the truth about what actually happened the next time there is a problem. Troubleshooting network problems is much easier if you have a correct description of the actions the user took just prior to a crash.

Always remember that the primary goal of any company is to produce a product, whatever it may be, in an efficient, cost-effective manner. Throwing stones is not the proper way to achieve that goal. If you maintain a good relationship with network users, they will not hesitate to contact you with problems or questions.

One issue that LAN managers must continually deal with is time management. In general, problems should be classified and dealt with according to priorities that both you and top management agree upon (see graphic).

Priorities may differ from company to company. The specific order of your priorities will depend on the production goals of your network.

However, keep in mind that blowing off users because you think the problem is petty is not productive. Always try to be responsive, even if you are currently involved with a higher priority problem. Listening to the person's problem and then suggesting a possible solution for the user to try until you've completed work on the current problem may help.

Make sure to update users and appropriate supervisors periodically about the progress being made in resolving any problems. As most network managers are aware, problems seem to occur simultaneously. Just when you think you are finally floating on an even keel, the tide comes in and swamps you.

Enlisting allies

Keeping all users satisfied when multiple problems arise takes a certain amount of effort. If a hardware problem in one department is occupying your attention exclusively, take a few seconds to call the manager of the other group to explain what's happening. This will help the managers involved to understand your priorities. You will also garner high marks for your crisis management ability.

Another problem that can prove embarrassing to the network manager is the complete failure of a system. Every network manager finds 100% uptime desirable and wants to be able to solve all problems without outside help; however, there always comes a day when all known remedies will not work.

At times like these, close cooperation with departmental supervisors will pay off. Be careful to describe the problem and your response to it accurately. In addition, try to give the supervisor suggestions on alternate ways to work.

Encouraging innovation while preventing unpleasant surprises takes practice.

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Also, a few words explaining the problem to the users involved will make them feel that they are in the know and that you are trying to help them in their jobs. Disgruntled users who continually complain to management that you are ignoring their problems create mistaken impressions regarding the network's status and cast aspersions on your professionalism.

All network administrators have users who, for various reasons, are difficult to handle. These will range from users who will take any opportunity to claim that the "computer is broken, and I can't get my job done" to users who just doesn't like anyone, particularly an "expert," telling them how to do their job.

First, try to turn these users into allies. Try to get them to see how you can all function together to produce a better product. Tell the users some of your concerns and the issues involved in network management. Superusers are not likely to consider compatibility to the network to be a major issue to the company. Work that can't be reproduced by other machines or users can be a major problem to your company.

The superuser can also be a problem if methods that he has developed do not work elsewhere on the network or within the company. Encourage your best users to document any innovations they come up with, such as good macros, menus and utilities. On the other hand, control of the network environment rests with the network manager. Make sure that all company managers stress this point to developers.

Be consistent and firm in your approach to network management. It will yield dividends to the company and you. If personnel within your company know what to expect from you and the network, they will be able to perform more effectively.

Encouraging innovation and new approaches while simultaneously preventing unpleasant surprises takes practice. Emphasize the testing and development process to other managers during discussions. This assures them that you are looking out for their interests while not closing down future options.

Try to maintain a helpful attitude toward new developments. Beware of developing a reputation for resisting network changes. Like a parent who is too strict and inflexible, this kind of behavior simply encourages the loading of software on the sly.

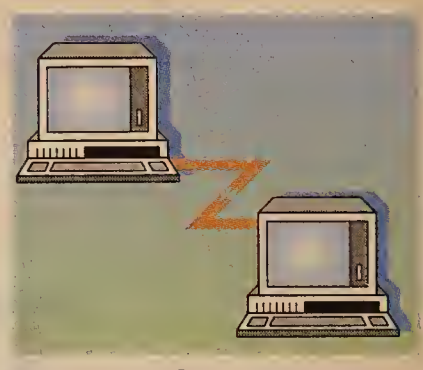
Periodic scans of the network for new programs may reveal this to you. If you find that users have been implementing new software without your knowledge, you may need to rethink your approach to this problem.

Troubleshooting guides

Writing and producing network troubleshooting guides can not only be a useful exercise but also can reveal new insights about the network. For example, producing a simplified network tree for users will show the net administrator where the greatest amount of space on the file server is used, allowing the administrator to balance usage of hard drives. In addition, troubleshooting guides may prove useful to departmental groups with large amounts of equipment. Usually, a good one with which to start that

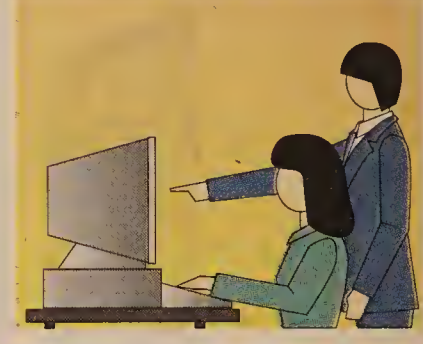
(continued on page 62)

Prioritizing network problems and tasks

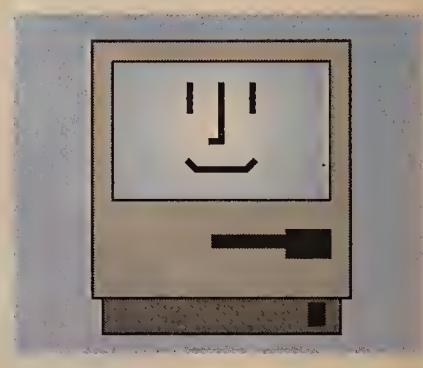


1. Outages

2. Application problems

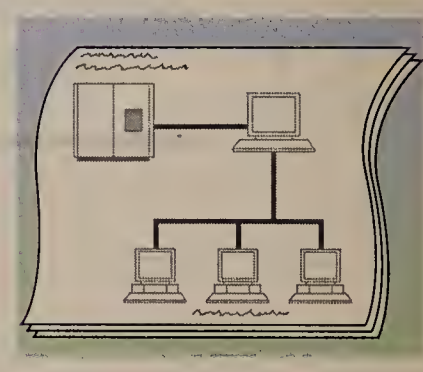


3. User training



4. Network enhancements

5. Preventive maintenance



6. Assembling/testing new systems and software

The specific order of priorities may vary depending on the production goals a company has for its network.

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NETWORK WORLD

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The human side of net management

continued from page 60

will significantly reduce your workload is a network printer guide.

To be useful, such a guide should contain only the basics. A three- to five-step list of things for users to check on their own before calling the network administrator can save the user embarrassment and allow the net administrator to focus on serious problems. Along the same lines, producing an overall system documentation package for upper management or for a backup administrator can also be helpful.

Many networks have a somewhat generic guide written by either the installation company or a previous network manager. You should review these to see how useful they are. If not written specifically for your net, how much help are they? Be as specific as possible when writing a manual. Include general tactics and details about network-specific file structure in the manual.

A successful network manager always keeps an ear to the ground. New developments within your organization can mean rapid changes to the network that you manage. Good anticipation of new developments can mean you are prepared for the surprises that can be sprung on you.

When top management feels they can rely on you to safeguard the company's interest, they will be willing to confide in you. Strategic long-term planning with your managers promotes your professional image. Your ability to quickly implement changes to the net you manage will be appreciated. However, always stress the need for planning major system changes.

A pleasant, cooperative, businesslike attitude will favorably impress many of the people that work with you. Reasonable explanations about the issues and problems faced in network management are a necessity. Top management expects you to make these issues reasonably clear to them in nontechnical language.

Professional standards in the networking field are not yet common. There are no convenient yardsticks to measure your job performance. The best that can be said is that you can make a difference to the people on your network. Their perceptions of computers and computer professionals will be greatly influenced by you.

Int'l firms strive for uniform nets

continued from page 36

Japan. The company's computer net consists of IBM 3090 Model 500 mainframes in the Gardena office and an IBM SNA backbone and local Token-Ring Networks to connect all sites to the Gardena office.

This setup is almost identical to the company's Japanese operations.

Voice, data and fax transmissions come in from 21 offices around the U.S. and are integrated and transmitted to the home office in Japan, where they are dispersed once again over the same type of network. The process works the other way as well, with Gardena serving as the dispersion point for information from Japan, according to Roberts.

Nissan has two Nippon Electric Industry Co., Ltd. T-1 multiplexers — one in Gardena and the other in Tokyo. Roberts said the company will begin transmission via a new undersea digital fiber-optic cable in June. That medium will cost as much to operate as the satellite it is now using, but it will be more reliable and will allow for cleaner transmissions.

For a company such as Boeing, which only has two small offices outside the U.S., standardizing operations isn't worth the perceived hassles of organizing the installation of small networks. Instead, Boeing allows foreign-based employees to buy, install and maintain their own nets.

However, the company requires that these users only buy equipment that can interact with the IBM Professional Office System E-mail net running in the Seattle home office.

Boeing has an office in England with 12 users as well as an office in Ireland with 32 users.

Letters

continued from page 45

pears silent in this matter. If AT&T sanctions the business of third-party discount long-distance marketing, why don't they say so in some official capacity?

End users must understand their own "cost basis" of long-distance services (effective cost per minute by rate mileage or equivalent) before getting sucked into a program of sharing "savings" on discounts below standard AT&T long-distance rates or sharing fees based on so-called "value-added" telemanagement services.

After all, if you are a relatively savvy user who now gets a minimum of 10% less than standard long-distance rates and you give up the important benefits of fractional-minute billing for aggregation full-minute rounded-up billing, you could lose more than you gain.

Nevertheless, there are some worthwhile opportunities to save big dollars (particularly in 800 services, Software-Defined Network and Tariff 12-type aggregation schemes), but you must do your homework carefully or call in the experts to insulate you from any of the inherent dangers.

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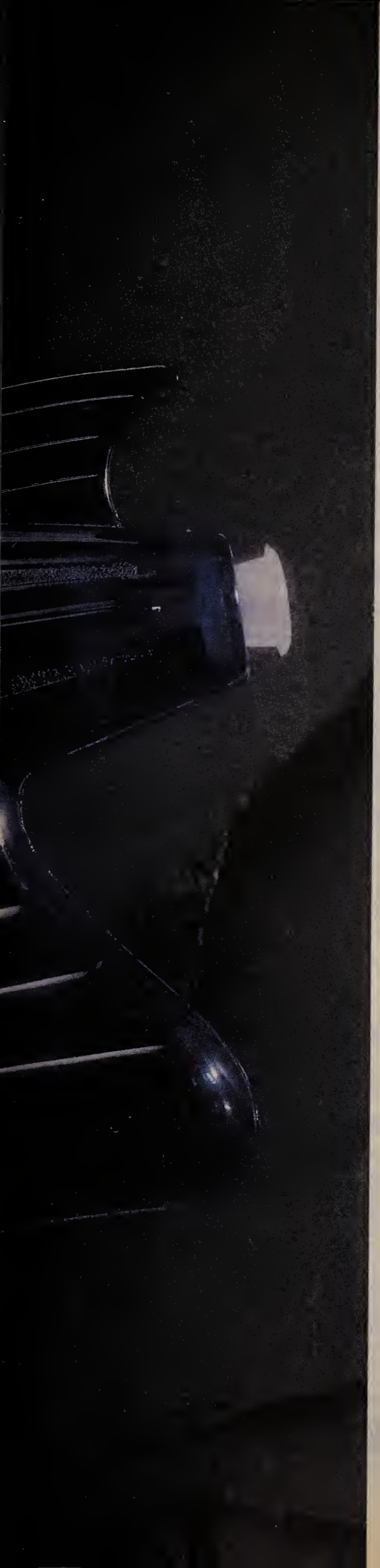

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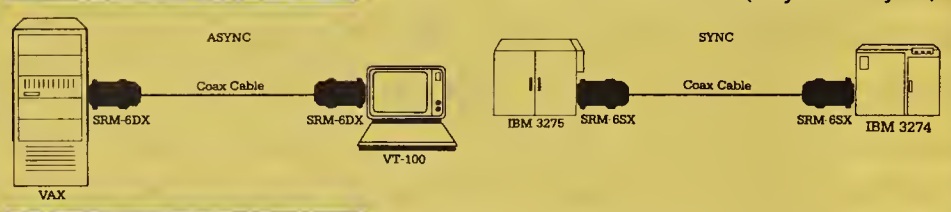

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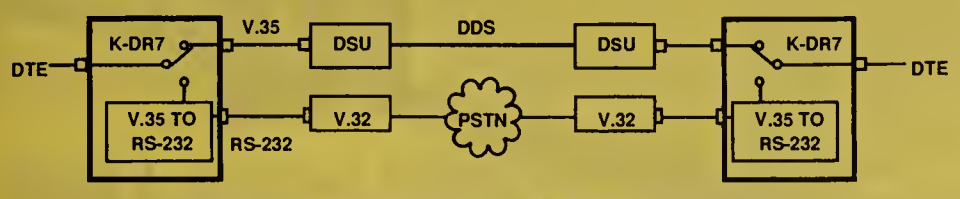

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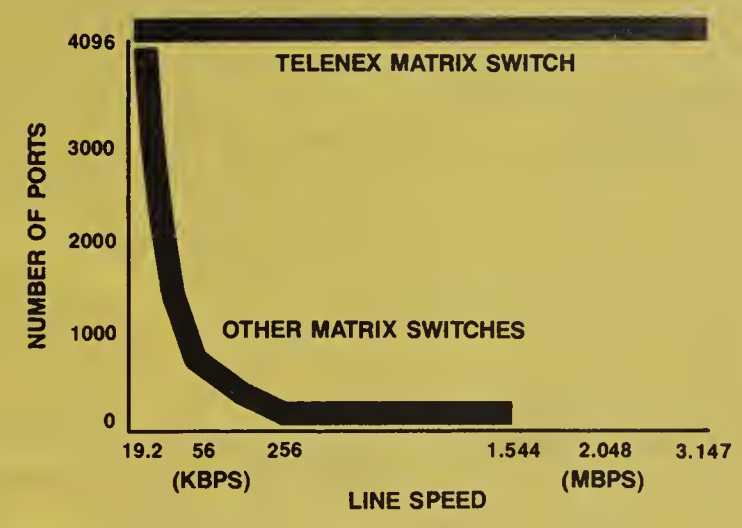

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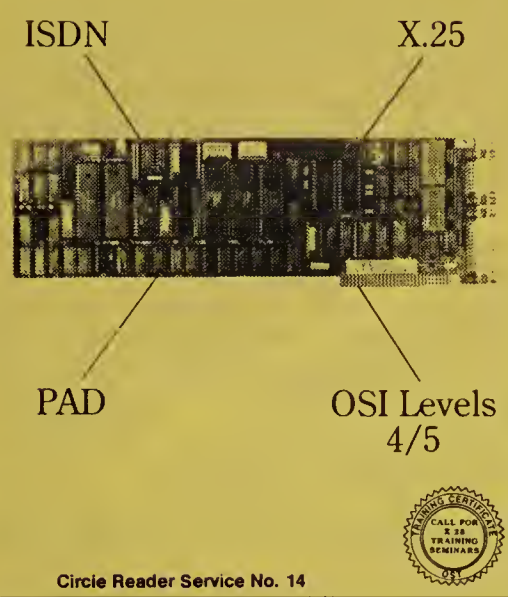

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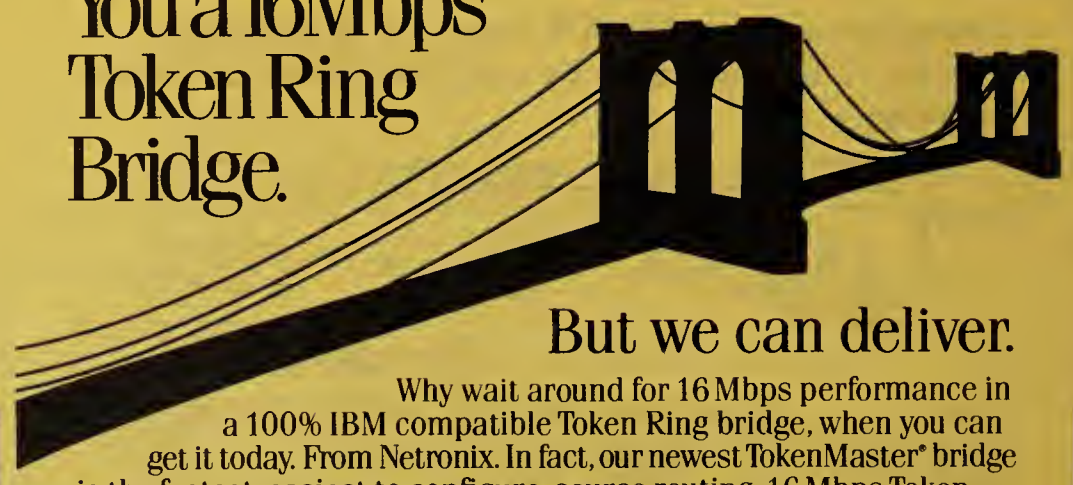

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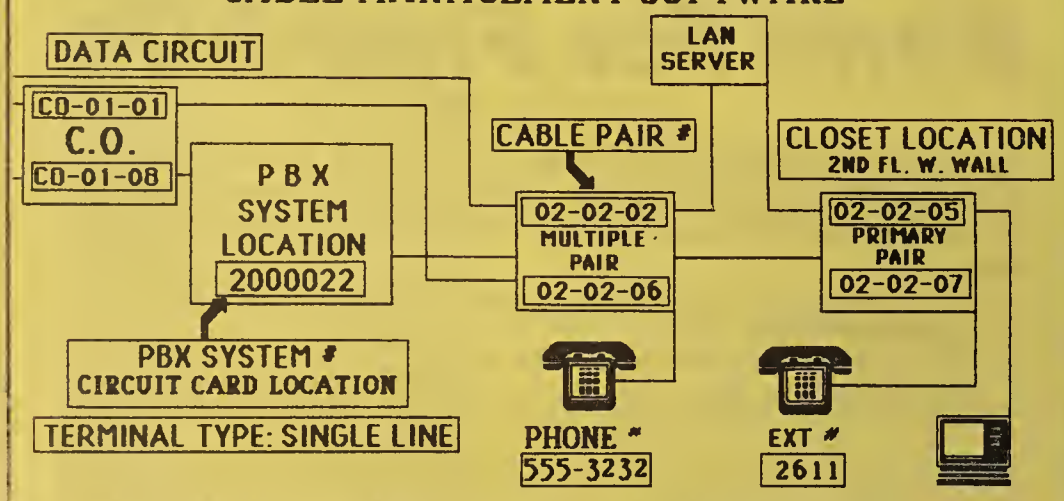

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Chapter 7 Case No.
87 B 10020 (PBA)

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PLEASE TAKE NOTICE that the United States Bankruptcy Court for the Southern District of New York has entered an order (the "Claims Bar Order") requiring all persons who assert a claim against Argo Communications Corp. ("Argo" or the "Debtor") arising (i) prior to January 7, 1987, when its case under Chapter 11 of the United States Bankruptcy Code (the "Code") commencced; (ii) between January 8, 1987, through February 11, 1987, when its Chapter 11 case was converted to one under Chapter 7 of the Code; or (iii) subsequent to February 11, 1987, whether such claim is fixed, liquidated, contingent or disputed, (other than claims of professionals retained pursuant to order(s) of the Court for services rendered in this case), to file a proof of claim, together with support documentation, specifying in which period such claim is alleged to have accrued, with the Bankruptcy Court substantially in conformity with Official Bankruptcy Form 15, on or before August 15, 1990 (the "Bar Date").

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The provisions of the Claims Bar Order apply to all claims of whatever character against the Debtor, its estate and its property, whether secured to unsecured, liquidated or unliquidated, fixed or contingent, or otherwise.

Copies of the Schedules, the list of known creditors and the claims Bar Order are available for inspection during the regular business hours at the office of the Clerk of the Bankruptcy Court, 6th Floor, United States Bankruptcy Court, Old Customs House, One Bowling Green, New York, New York, 10004.

Dated: New York, New York
May 7, 1990

BY ORDER OF THE COURT

DONOVAN LEISURE NEWTON & IRVINE
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Industry Briefs

continued from page 13

MCI Communications Corp. last week announced X.400 links between its MCI Mail electronic mail service and the services of eight other U.S. and foreign E-mail vendors.

The interconnections enable users of MCI Mail to swap messages with mailboxes on E-mail nets provided by Dacom Korea, GE Information Services, Infonet Services Corp., OTC Australia, General Bureau of Post, Telegraph and Telephone Administrations in Switzerland, Telecom Australia, Transpac France and Western Union Corp.

These interconnections bring the number of MCI X.400 links to 14. Other services that MCI connects to via X.400 include AT&T Mail, Belgium RTT, Dialcom, IBM Information Network, PT Postel and SprintMail.

Separately, MCI announced it will open a second International Test and Maintenance Center on the West Coast for network troubleshooting and repair. Located in Lodi, Calif., the new center will replace San Francisco as MCI's primary Pacific gateway location.

Newbridge Networks, Inc. of Herndon, Va., and **Make Systems, Inc.** of Mountain View, Calif., last week announced plans to jointly develop an enhanced version of Make's Netool decision support software.

Under terms of the agreement, each company would separately market the results of this joint development.

The vendors last week demonstrated the first result of their joint project at the International Communications Association's 43rd Annual Conference and Exposition in New Orleans. They demonstrated the 5612 MainStreet Network Planning Tool, a tool that will enable users to simulate the behavior of complex networks under test cases ranging from failure analysis to new growth scenarios.

Arcnet vendor **Datapoint Corp.** last week posted a net loss of $8.4 million for its fiscal third quarter, which ended April 28. The results included an operating loss of $3 million on revenue of $67.1 million for the period, plus $5.4 million in charges related to net interest expenses.

The results compare with a loss of $19.3 million on revenue of $75.5 million for the third quarter a year ago.

For the first nine months of fiscal 1990, Datapoint posted an operating loss of $13.6 million on revenue of $194.7 million. This compares with a loss of $18.1 million on revenue of $233.6 million for the first nine months of fiscal 1989.

MCI Communications Corp. last week said two major Japanese trading companies have awarded it service contracts to provide COMM Advantage network management services. MCI valued the contracts at a total of $10 million over a five year period.

Mitsui & Co. USA, Inc. will use the service to manage its voice, messaging, facsimile and data traffic among Japan, the U.K. and the U.S. **Nichimen America, Inc.** will use MCI's new COMMAX service for voice, data and message traffic. With COMMAX, Nichimen will access a preprovisioned shared network linking centers in Japan, the U.K. and the U.S.

Metcalfe resigns from 3Com

continued from page 4

now it's time for me to get out of the way," Metcalfe said.

Although Metcalfe is stepping down as a 3Com vice-president and member of its board of directors, he will stay with the firm in a consulting capacity. He will continue to represent 3Com on the executive committee of the Corporation for Open Systems International (COS) for at least the next year, he said.

"There are also several multimillion-dollar customer accounts that I'll continue to service for the forseeable future," Metcalfe added.

> "I'm disappointed that I didn't get to be president, but on the other hand, I still care a lot about most of the 1,900 employees here, 3Com's customers and my stock."

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Metcalfe said that although he has mixed emotions about his departure from 3Com, bitterness was not among them.

"I'm disappointed that I didn't get to be president, but on the other hand, I still care a lot about most of the 1,900 employees here, 3Com's customers and my stock, and there's no rancor," Metcalfe said.

Metcalfe said he has no immediate plans for the future other than to spend the summer vacationing with his family in Maine, being a "tennis bum, perennial father and possibly dabbling in some right-wing journalism."

3Com, meanwhile, plans to honor Metcalfe next Monday, June 4, on the 11th anniversary of the company's founding. The company said the new five-story building housing 3Com's visitors' center and corporate staff offices will be named "The Metcalfe Building" to commemorate Metcalfe's significant contributions to the company.

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Novell, Lotus call it quits at the altar

continued from page 1

of the combined companies, to change the name of the company to Lotus/Novell Corp. and to give written guarantees to Novell that Noorda would have at least a two-year tenure as chairman.

Noorda apparently was satisfied with the concessions, but at the last minute killed the deal by tabling the four/four board requirement, even though he had originally proposed that the company have a board consisting of three Novell representatives and four Lotus executives.

"A four/four board is a recipe for deadlock," Manzi said. "We terminated the discussions solely because Novell interjected that at the 11th hour and 59th minute. The question of a four/four board hadn't even been raised over the last 20 days."

Novell said it backed out of the merger because its board of directors wanted an equal say at the board level to show shareholders the deal was a merger of equals.

But analysts are still speculating. Some say Noorda may have had his own motivation for scrapping the deal, while others say he wound up the victim of his own machinations and was finally forced by the board to scrap the deal.

David Atlas, a software analyst at International Data Corp. (IDC) in Framingham, Mass., said the latter explanation is the most plausible. "I don't think Noorda had a hidden agenda, but the way he shrouded the negotiations in secrecy from the start [by not telling anyone at Novell of his plans] ultimately did him in," Atlas said. He added that Noorda underestimated the ground swell of dissatisfaction with the deal among Novell employees and shareholders.

"Noorda continued to publicly deny rumors of discord to the press and Manzi, so Manzi never got a clear picture of what was really going on at Novell," Atlas said.

Manzi, though, doesn't find merit in that explanation. "The whole situation is unintelligible to me, to put it politely," he said. "When Ray initially approached Lotus with a proposal to merge, he did so without telling anyone on his board. Only Novell's corporate attorney knew about the plans. So the notion that his board made him back off the deal is ridiculous."

During a teleconference call last week, Noorda said he was disappointed that the deal fell through. "We didn't reject Lotus; we have only the highest regard for Lotus and Jim Manzi. But our board of directors wanted an equal constituency so that we could show our shareholders that it was a true merger of equals," Noorda said.

Despite such disclaimers and Noorda's insistence that Novell will continue to push for joint sales, marketing and technology agreements between the two firms, analysts remained skeptical of Noorda's version of the events.

"When you leave the groom at the altar, it's just possible that you've got someone else waiting in the wings," opined Richard Dorfman, an associate at Broadview Associates, an investment banking firm in Fort Lee, N.J.

Robert Metcalfe, vice-president of 3Com Corp. and a veteran of several successful and unsuccessful mergers, said he thinks "the underlying reason for calling off the deal was that the greedier Novell shareholders wanted a premium; the request for a four/four board was the technicality used so the deal would look more like a merger," Metcalfe concluded.

Now Lotus and Novell must prepare separate strategies to compete with chief rival Microsoft Corp., analysts said. That job will be even more difficult now since Microsoft consolidated its position as an industry leader last week when it unveiled the latest release of its Windows software (see "Microsoft intros Version 3.0 of Windows system," page 6).

"On the one hand, scuttling the deal doesn't change the fact that Lotus' future looks bright," Dorfman said. "It commands over 60% of the spreadsheet market and has significantly enhanced 1-2-3 with Release 3.1. And its Notes offering basically has the fledgling groupware market to itself."

"On the downside," he said, "without Novell, Lotus is certainly a smaller and less powerful competitor than Microsoft."

The analysts also said that Novell's credibility has been damaged because it handled the breakup badly, but they don't think its current business will be affected.

Doug Gold, director of communications industry research at IDC, concurred. "Noorda's credibility as a deal maker is clearly in doubt. Besides that, the damage is 50-50; Novell could have used Lotus' applications and Lotus could clearly have benefited from Novell's muscle in the network operating system arena, as well as its strength in the distribution channel."

Hughes Network supports frame relay

continued from page 4

link Communications Corp.

DEC has volunteered to host vendor sessions beginning next month to review the various implementations in an effort to ensure interoperability, Mauceri said.

For its part, Hughes will add frame relay to the X.25 interface its IPN switch already supports, said Gerald Shipley, director of marketing for the company.

Frame relay will run instead of, or along with, X.25. For example, users can dedicate some channels off a T-1 backbone to frame-relay data and others to T-1, he said.

The need for speed

The main advantage of frame relay over X.25 is speed.

With X.25, the IPN supported speeds up to 64K bit/sec on both the network and premises side, Shipley said. With frame relay, that speed is bumped up to T-1 or E-1, he said.

Hughes said it plans to support frame relay with new boards and software that work with the existing IPN models. The company plans to beta-test the products during the second half of this year and have them generally available in the second quarter of 1991. Pricing has not yet been determined.

Users react to failed merger

NEW ORLEANS — Users at last week's International Communications Association 43rd Annual Conference and Exposition here expressed surprise and disappointment over the collapse of the proposed Novell, Inc. and Lotus Development Corp. merger.

The so-called "merger of equals" unraveled after Novell insisted on equal representation on the board of directors of the merged company.

"I think it's a mistake," said Paul Conrow, director of communications engineering and operations at Fireman's Fund Insurance Co. in San Rafael, Calif. "It would have been a good business relationship. Microsoft [Corp.] could use the competition."

Conrow said the merger would have helped Novell broaden its product line with much-needed applications.

"It's important that applications be integrated with some sort of transport mechanism," Conrow said. "That's what I was looking forward to with Novell's networks and Lotus' spreadsheet applications."

Conrow added that he wouldn't be surprised to see Novell merge with an enterprise network vendor, possibly even a carrier.

Another user, who requested anonymity, said the failed merger will give Microsoft a boost. "Both Lotus and Novell are going to have to be players in the OS/2 environment, and they have a better chance of succeeding together than by themselves," he said.

He said he is frustrated by Novell "making promises and failing to come through in a timely fashion." He cited Novell's failure to rapidly bring to market Apple Computer, Inc. Macintosh support for NetWare and its failure to quickly deliver a NetWare shell that consumed less memory.

The user said the failed merger is one more reason his company is looking to migrate away from Novell.

Other users reacted less severely.

Robert Schnibbe Jr., administrative vice-president at Manufacturers and Traders Trust Co. in Buffalo, N.Y., said he is disappointed that Novell and Lotus will not merge, but his confidence in the companies is not shaken.

"I could see some synergies between the two companies, and I could see where Novell would benefit," he said.

On the other hand, he added, the move had raised questions about what the new company's primary business focus would be and whether development would be delayed while the merger activity was taking place.

One concern that Schnibbe has is that Novell has "opened its kimono," showing the industry it needs help and "is interested in a buyout." Novell would appear to be "more vulnerable now," he said. "I'm a strong supporter of Novell, so I just hope this doesn't hurt the company," he said.

— Bob Brown

Carriers open up to give users control

continued from page 1

sen Consulting survey. In that survey, users reported that they want access to carrier systems for billing, network operations, order entry, and net design and planning (see graphic, page 1).

Andersen Consulting interviewed 250 users with network budgets ranging from $100,000 to $10 million a year.

The survey showed that users are most interested in access to carrier billing systems in order to perform such tasks as consolidating bills for all their services into a single file and helping to ensure billing accuracy and resolve disputes faster.

"The paperwork load involved with billing is a curse that our telecommunications department would be happy to eliminate," said Oleh Zajac, licensing coordinator for Supervised Worldwide Intelligent Forwarding Network (SWIFNET), a sophisticated phone answering system developed by Ambassador College in Pasadena, Calif.

Access to the carrier network operations systems will enable users to enter and track trouble tickets, view circuit test results and request circuit tests.

That would speed problem resolution, said John Crankshaw, manager of telecommunications at Grand Rapids, Mich.-based Steelcase, Inc. and an AT&T Software-Defined Network user. "We'd like to automatically generate an alarm at our [network control] center that would be sent to the AT&T network to set in motion the process of fixing the problem right away."

With on-site access to order-entry systems, users can directly enter requests for new services or cancel existing ones, make sure service changes will be executed on time and verify the accuracy of orders.

James Laux, information services officer for technology research and architecture at Firstar Information Services Corp. in Milwaukee, said that would be particularly helpful in dealing with local carriers.

"Our backbone network is pretty static," Laux said. "Local service is another story though." Laux said his firm is constantly changing the mix of services it acquires from Wisconsin Bell, Inc.

Users want access to the carriers' own network planning software and tariff data bases so they can optimize their networks for cost and performance.

On-line access to tariff data will also enable users to make sure they are not being charged older rates when new tariffs go into effect, Laux said.

While carriers can and do offer access to some of their management systems, none currently provides access to all of them.

The first step carriers must take to support that type of service is to integrate the different systems used to operate their networks, said Alan Burgess, worldwide managing partner for Andersen Consulting's Telecom Industry Group. These systems often are based on disparate hardware and operating systems.

Next, carriers must be able to transmit data to users in a standard format, said Pete Bott, an Andersen Consulting senior partner. "The systems that are established will have to be flexible enough to accommodate the way in which the majority of customers want to receive information."

Some consultants say they believe AT&T and MCI are ahead of US Sprint Communications Co. in providing such services. "MCI and AT&T have both got the right idea," said James Herman, a principal with Northeast Consulting Resources, Inc. in Boston. "[US] Sprint is far behind in mapping out a strategy for their products and the different features they'll provide."

AT&T already offers a set of on-line management services under its Accumaster Network Management Services umbrella. AT&T recently came out with on-line services enabling users to enter and track trouble tickets ("AT&T bolsters Accumaster net management services," *NW*, May 14) and has been concentrating on providing services that enable customers to monitor faults and performance on circuits.

AT&T is trialing a service that enables users to directly access billing information on AT&T computers, said William Gilbert, the carrier's director of network management. AT&T already enables its 800 service customers to enter service orders online and plans to allow users of its other services to do the same in the near future.

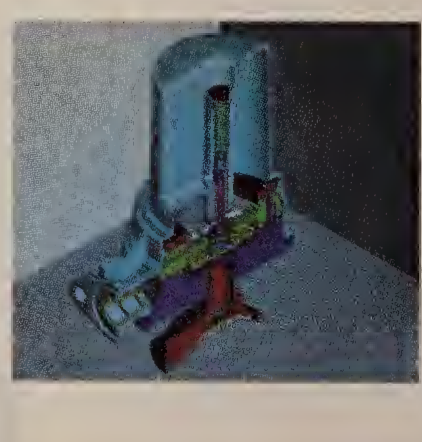
MCI has announced plans to package similar management services under its Integrated Network Management Services offering. However, it will be a few years before it can accomplish that goal.

US Sprint is offering some management services under its Insite line of services.

The regional Bell holding companies are struggling to formulate their own strategies. "The RBHCs are not doing a good job of pulling together on this issue," Herman said. Four of the seven have taken steps to address the issue. Ameritech, Nynex Corp., Southwestern Bell Corp. and US West, Inc. all funded a Bell Communications Research project to develop software that will enable them to offer on-line management services.

Called Customate, the software will run on a central office-based minicomputer. ASCII terminals and microcomputers emulating ASCII terminals at customer locations will be linked to the minicomputer via dial-up or leased lines.

Customate then provides a menu that enables customers to select a specific function. Once the function is selected, Customate runs a series of software routines to retrieve needed data from the computers running the carrier network, convert that data to a common format and transmit it to the customer. The four RBHCs that funded the Customate development have taken delivery of it and are starting to use it to let users enter trouble tickets or orders. ◼



ICA urges users to pressure RBHCs

continued from page 2

marketing new technology in predefined packages, [the RBHCs] limit users' choices and their ability to pay for only what they truly require," the paper stated.

The ICA white paper also contends that the RBHCs are pouring most of their network investments into such efforts as fiber to the home, positioning themselves to move into new business areas, rather than improving the reliability, efficiency or scope of basic exchange services.

"While billions of dollars in ratepayer-generated funds may be spent to upgrade the public network, these efforts are not likely to expand the capabilities of the local exchange in ways that will be beneficial to sophisticated business users," ICA said.

A slap on price caps

The paper also criticized the RBHCs' attempts to win price cap regulation at the state and federal levels. ICA claims that rates should be falling from current levels, rather than being frozen, which is what would happen under price cap regulation.

The RBHCs want to retain current revenue levels so that they can fund expansion into nontraditional services, ICA charged in the paper.

Crampton, who presented the white paper to the ICA membership, said the paper should be used as a reference document when discussing concerns with state regulators, carriers and company executives.

ICA said users must convince the RBHCs to treat their networks as open platforms on which customers can build applications, rather than jealously guarding them as monopoly assets. To date, the RBHCs have resisted an open net approach as a competitive threat, the paper said.

Such an approach is in the RBHCs' own interest because it will promote greater usage of the local exchange. If the RBHCs do not adopt this approach, new services will be stifled, ICA said.

As an example, the paper blames RBHC business practices for the slow acceptance of Integrated Services Digital Network. The group claims that the RBHCs have not made ISDN technology open enough for users to design applications and that they have priced the services at a premium.

Ultimatum to MCI for LATA access fee

continued from page 4

WATS, Ultra WATS and Virtual Private Network services.

"We aren't happy with the compensation rate," said Craig Dingwall, US Sprint's general attorney. Dingwall said US Sprint entered the compensation agreement with the understanding that the board would review the rule in the future. An AT&T spokesman said, "The choice for us was to pay the compensation or not provide the service. Our view has always been that the services we're offering are not in competition with New Jersey Bell's offerings."

William Marmon, MCI's regulatory director for the Mid-Atlantic Division, said MCI will file its own services list and begin payment. But the carrier intends to fight the compensation rule in the proceeding.

All three carriers argue that New Jersey is stifling technological development. For virtual private nets or 800 services, "it's technically infeasible to block [the call] or give it to New Jersey Bell," Marmon said. He called the state's compensation plan "an antitechnology solution."

Michael Gallagher, director of telecommunications for the New Jersey Public Utilities Board, said "We want to allow technology, but we want to go step by step. We're allowing the interexchange carriers to complete calls, but we're balancing that against the ratepayers' interests." Gallagher said the state is undergoing a review of its policies and is open to change.

Pat Scirico, director of New Jersey Bell's regulatory division, which works with the board, pointed out that New Jersey's rates to residential subscribers are among the lowest in the country. She said those rates are subsidized by revenues from business customers. About $58 million in revenue is at risk from interexchange intrusion, she added.

The compensation charge is just "recovery of the revenue we are entitled to," Scirico said. "The intra-LATA market is our market."

Group appeals order to reconsider MFJ

continued from page 4

ties may be added to the petition before it goes to the Supreme Court.

The group is arguing that the appeals court should not have questioned Greene's interpretation of the Modified Final Judgment because he has extensive knowledge of the document and experience overseeing it. Greene wrote the Consent Decree and has overseen it since 1984.

The group also said the appeals court was wrong to suggest that Greene misinterpreted several major provisions of the Consent Decree. Greene had ruled that the RBHCs must make the same legal case for entering new business areas whether or not major parties to the Consent Decree contested their plans.

Historically, Greene has considered whether there is a substantial possibility that the RBHCs could use their network control in an anticompetitive fashion if allowed into a particular line of business. But the appeals court told Greene he should prevent the RBHCs from entering a market only if it is certain they would act anticompetitively.

The petitioners said they believe the Supreme Court will take up the case at the start of its new term in October.

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THE INDUSTRY STANDARD

AT&T unveils data net service

continued from page 1

vice will be available through 500 AT&T points of presence (POP) and will enable users to establish dial-up data links to any site on their existing SDN. Customers need T-1 access to support 64K and 384K bit/sec and at least 56K bit/sec Dataphone Digital Service to access SDDN at 56K bit/sec. The SDDN speeds supported have to be presubscribed and preprogrammed into AT&T's net.

SDDN requires a 120-day service installation interval, according to Frank Ianna, director of outbound services for AT&T.

AT&T said SDDN offers SDN users digital private line-like performance with a bit error rate of 10^{-6}; 95% error-free seconds on 95% of premises-to-premises calls; 95% error-free on 99% of POP-to-POP calls; and 95% error-free on 98% of premises-to-POP calls.

SDDN is expected to be generally available at 56K bit/sec in July. Controlled introduction of SDDN at restricted and clear-channel 64K bit/sec will begin Oct. 3, with general availability scheduled for December 1990.

SDDN 384K bit/sec will be out in the first quarter of 1991. Although AT&T made no mention of SDDN T-1 speeds, Daniel Briere, president of TeleChoice, Inc., a Manchester, Conn.-based consultancy, said the carrier will offer T-1 support in the second half of 1991. AT&T already offers a switched T-1 service, Accunet Reserved 1.5, but that service can only be accessed at prearranged times.

When accessed with ISDN PRI, SDDN will support an automatic restoration capability that allows users to reestablish interrupted data calls in about 20 seconds.

When the central office switch senses a service interruption or outage, it sends an error message back to the customer's switch over the D signaling channel of the PRI link. The switch then reestablishes the call, according to Willem Weijer, an SDN product manager with AT&T.

AT&T's Definity PBXs and AT&T Paradyne's T-1 multiplexers will be equipped to support the automatic restoration capability by year end, Weijer said. AT&T has published technical specifications for the capability and will test other vendors' equipment for compliance at AT&T Bell Laboratories.

SDN users at the conference applauded the new feature but said they need to analyze SDDN pricing before determining if and how they would use it.

SDDN has eight mileage bands, and daytime rates range from 2.85 cents for the first 18 seconds of use and .95 cents for each additional six seconds for the shortest mileage band, to 6.63 cents for the first 18 seconds and 2.21 cents for each additional six-second increment for the furthest band (see chart).

The service also has a $100 per-site installation charge. Evening and night/weekend rates for SDDN are lower than daytime prices. SDDN users can combine their SDN and SDDN usage to qualify for volume discounts.

According to Briere, unlike its competitors, AT&T has come up with a separate rate schedule for SDDN and is charging a premium for the service. SDDN prices at 56K bit/sec are 50% to 90% higher than SDN rates for on-net-to-on-net SDN voice calls, he said.

AT&T's Frank Ianna

MCI Communications Corp. and US Sprint Communications Co. have been offering switched 56K bit/sec at the same price as virtual net voice calls, Briere said. However, US Sprint and MCI do not offer support for 384K bit/sec dial-up data services.

Despite the high prices, SDN users see promise in SDDN.

SDDN will be a viable alternative to dedicated facilities, said Barney Lykins, president of the 250-company SDN Users Association and network planning manager for Navistar International Transportation Corp.

"SDDN holds great potential for SDN users," Lykins said. "Companies are going to have to reevaluate virtual networks as a means of carrying data." Navistar operates an SDN with roughly 50 dedicated access sites and 150 switched access locations.

AT&T's Ianna said he expects SDDN to augment customers' private networks rather than replace those nets.

Software-Defined Data network daytime rates

Mileage band	First 18 seconds	Each additional six seconds
0 to 55	$.0285	$.0095
56 to 292	.0375	.0125
293 to 430	.0456	.0152
431 to 925	.0510	.0170
926 to 1,910	.0525	.0175
1,911 to 3,000	.0540	.0180
3,001 to 4,250	.0657	.0219
4,251 to 5,750	.0663	.0221

GRAPHIC BY SUSAN J. CHAMPENY — SOURCE: AT&T, BASKING RIDGE, N.J.

NCR first to beta-test AT&T's SDDN

NEW ORLEANS — NCR Corp. said last week that it will become the first company to beta-test AT&T's new Software-Defined Data Network (SDDN), a Software-Defined Network service option that supports dial-up data communications at speeds from 56K to 384K bit/sec.

NCR, which began using SDN in 1986, will use SDDN to link 4M bit/sec token-ring local nets at geographically dispersed field sales and service offices.

NCR's desire to find an affordable means of supporting videoconferencing was the driving force behind its decision to test SDDN.

"We see SDDN as a very cost-effective way of establishing communications to carry one to two hours of videoconferencing a week," said Fred Davidson, corporate telecommunications director for Dayton, Ohio-based NCR.

Davidson said he also finds "SDDN's dial-up 384 capability an attractive option for LAN-to-LAN connectivity and a number of other applications. With SDDN, we can set up high-speed switched connections without having to use an extremely expensive fixed leased circuit."

If NCR is pleased with the feature and its pricing, it will move some traffic from its private data network to SDDN. "A great deal depends on how the test goes and our SDDN cost analysis," Davidson said. "We view SDDN as an important weapon in our arsenal that will enable NCR to compete in the 1990s."

SDDN will likely supplement, not replace, NCR's nationwide VSAT network, which supports one-way business television applications and carries low-speed data communications.

Davidson said NCR currently operates a nationwide 170-site SDN, including 40 dedicated access sites and 130 switched access locations. NCR's SDN carries an average of 3.2 million minutes of traffic a month.

— Bob Wallace

Users examine new DSU/CSUs

continued from page 2

In terms of net management, all of the vendors' DSU/CSUs will work with carrier services that support a side channel for net management data, such as AT&T's Dataphone Digital Service II.

But some vendors offer less than full-featured network management with regular digital data service (DDS), which does not include the net management channel. Fujitsu America, Inc., for example, supports net management on DDS 56K bit/sec links only when the user is running data at less than 56K bit/sec.

Other vendors, such as Racal-Milgo and AT&T Paradyne, announced DSU/CSUs with a bit-robbing scheme that lets users support net management with regular DDS services, albeit at the expense of useable bandwidth.

All of the vendors offer a proprietary element management system that supports their own DSU/CSUs but not their competitors'. That means users are, in effect, tied to a single vendor for DSU/CSUs if central-site network management is a key issue.

The vendors also have products or plans for managing their DSU/CSUs from integrated net management systems such as IBM's NetView or AT&T's Accumaster Integrator.

Fujitsu and Racal-Milgo, for example, support NetView links via NetView/PC, while Codex Corp. provides an optional capability that supports a direct NetView link. AT&T Paradyne is planning a similar capability by year end.

Stephen Kelley, director of telecommunications corporate consulting at John Hancock Mutual Life Insurance Co. in Boston, said his company chose IBM DSU/CSUs in part because they could be managed directly from NetView. John Hancock is in the final stages of converting some 400 sales sites from analog to digital lines.

Mux options

Laux cited an integrated TDM capability as an issue of growing importance with DSU/CSUs because digital lines offer more bandwidth than analog and, therefore, users can support more devices with a single line.

AT&T Paradyne and Racal-Milgo both support a six-port integrated TDM, while Codex offers an eight-port version.

Since digital links are likely to be carrying more data than analog facilities, users said automatic dial restoral takes on added significance. All of the vendors announced some scheme for supporting link restoral over analog lines and, in Racal-Milgo's and Codex's case, over switched 56K bit/sec digital services. In addition, Fujitsu and Racal said they can support a feature that lets users block out the dial backup at predetermined times, such as on weekends.

(continued on page 78)

Microsoft intros Windows 3.0

continued from page 6

his environment, Gates said.

The second component of the user shell, File Manager, provides users with maps of both their workstation disk drives and network server drives. File Manager displays listings of directories, files and programs, as well as their locations on a particular workstation or network server, in a directory tree format.

The File Manager portion of the user shell contains a menu selection that enables users to connect to and disconnect from file servers at will. All previous connections are stored in system memory, allowing users to reconnect to particular file servers with a mouse click or keystroke.

With File Manager, users can manipulate and locate files by utilizing a mouse or a keystroke to call these files from anywhere on the system or across the net.

The third portion of the user shell is the Control Panel, which enables users to add, delete and configure local and network printers by using the printer option in the application.

The Control Panel portion of the user shell also exploits Windows 3.0's advanced color graphical capabilities to let users custom-design the way a particular application or report will appear on screen. Users can, for example, scan pictures or drawings for their own screen background or choose their own on-screen colors from a set of available backgrounds called "wallpapers."

Windows yes, OS/2 maybe

The general consensus among analysts and even industry competitors is that Windows 3.0 was well worth the wait. While breathing new life into MS-DOS, it could also serve to further delay the thus-far lukewarm acceptance of OS/2 and, by association, LAN Manager, analysts said.

"Windows 3.0 will kill OS/2 by preventing it from getting critical mass," said Bill Joy, vice-president of research and development at Sun Microsystems, Inc. "That's great — it will give us enough time to get Unix out there on inexpensive [Reduced Instruction Set Computer] machines."

Windows 3.0 is available now and costs $149 for a single-user copy in English, French and German language versions. Current Windows 2.0 users can upgrade to the 3.0 version for $50. The upgrade can be obtained by calling (800) 323-3577.

Susan Breidenbach also contributed to this story.

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